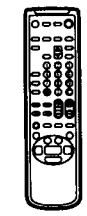
SERVICE MANUAL

BC-4 CHASSIS

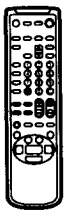
MODEL	COMMANDER	DEST.	CHASSIS NO.
KV-21V5A	RM-C810	Italian	SCC-N40D-A
KV-21V5B	RM-C812	French	SCC-N42D-A
KV-21V5D	RM-C810	AEP	SCC-N39D-A
KV-21V5E	RM-C810	Spanish	SCC-N41D-A
KV-21V5K	RM-C813	OIRT	SCC-N32C-A
KV-21V5U	RM-C811	UK	SCC-N43D-A

MODEL	COMMANDER	DEST.	CHASSIS NO.
KV-21V6A	RM-C810	Italian	SCC-N40B-A
KV-21V6B	RM-C812	French	SCC-N42B-A
KV-21V6D	RM-C810	AEP	SCC-N39B-A
KV-21V6E	RM-C810	Spanish	SCC-N41B-A
KV-21V6U	RM-C811	UK	SCC-N43B-A

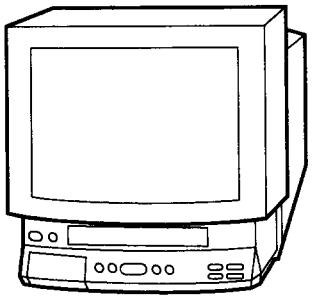
Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT Ⅳ for MECHANICAL ADJUSTMENT. (Part No. 9-973-623-11)



RM-C813



RM-C810
RM-C811
RM-C812



MICROFILM

TRINITRON® COLOR VIDEO TV

SONY®

※ Please file according to model size. ..... ■

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SPECIFICATIONS

TV Section

Television system B/G,L
Color system PAL,SECAM
NTSC3.58/NTSC4.43(VIDEO input only)
Channel coverage See "Receivable channels and channels display" balow.
Picture tube Hi Black Trinitron
Aerial in 75-ohm aerial socket for VHF/UHF

Video Section

Format VHS standard
Video recording system
Rotary 2-head helical scanning system
Audio recording system
Monaural
Video signal PAL/SECAM
Tape speed PAL/SECAM
SP : 23.39mm/sec.
LP : 11.70mm/sec. (PAL only)
NTSC
SP : 33.35mm/sec.
LP : 11.12mm/sec.
Maximum recording time
SP : 4 hours with E-240
LP : 8 hours with E-240

Inputs and Outputs

Inputs LINE IN VIDEO:phono jack (1)
1 Vp-p, 75 ohms, unbalanced, sync negative
LINE IN AUDIO:phono jack (1)
Input level:500 mVrms (100% modulation)
EURO-AV : 21-pin
Output EURO-AV : 21-pin
Head Hone Jack Monaural minijack

General

Clock Quartz locked
Clock back up Approx. 7days
Power requirements
220-240 V AC, 50Hz

Power consumption
KV-21V5A,D,E,K,U : 97W
KV-21V6A,D,E,U : 103W
KV-21V5B/21V6B : 81W

Operating temperature
5°C to 40°C(41F° to 104°F)
Storage temperature
-20°C to 60°C(-4°F to 140°F)
Dimensions 526 x 518 x 476 mm (w/h/d)
(20 3/4 x 20 1/2 x 18 3/4 inches)
Mass 24kg (30 Ib 14 oz.)

Accessories supplied

Remote Control (1)
R6 (size AA) batteries (2)
Aerial (1)

Design and specifications are subject to change without notice.

Note

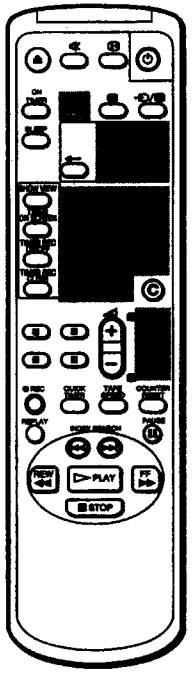
This appliance conforms with the EU Directive 89/336/EE3 regarding interference suppression.

Receivable channels and channel displays

TV System Band	B/G	L(B)	I(U)	D/K(K)
Low VHF band	E2–E4	F2–F4	–	R1–R5
Hight VHF band	E5–E12	F5–F10	–	R6–R12
UHF	E21–E69	F21–F69	B21–B69	R21–R69
CATV	S01–S05	B–Q	–	S01–S05
	S1–S41	S21–S44	–	S1–S41

The operation instruction mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remain as in the manual. (Part No : 3-860-137-11)

Step 3 — Tuning in to TV Stations



You can preset up to 80 TV channels, either automatically or manually. The automatic method is easier if you want to preset all receivable channels at once. Use the manual method if you want to allocate programme numbers to the channels one by one.

Before you begin

- Depress the ⏻ (MAIN POWER) switch, located behind the cover on the front of the video TV, to turn the TV on.
  If the ⏻ lamp on the video TV is lit in red (indicating that the video TV is in standby mode), press ⎔, PROGR +/– or a number button on the remote control.

Selecting the menu language

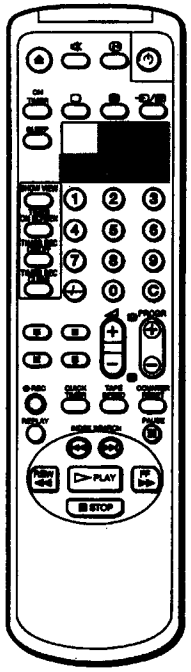
You can select one of several languages for the menu and on-screen information.
The initial setting is English.

1 Press MENU.
The main menu appears.

2 Move the cursor (▶) to "LANGUAGE" with + ◊ or – ◊ and press OK.
The LANGUAGE menu appears.

3 Select the language you want with + ◊ or – ◊ and press OK.
The selected language is coloured green, and the menu appears in the selected language.

4 Press MENU to return to the original screen.



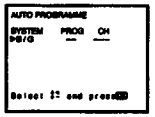
To stop automatic channel presetting
Press ⇦ on the remote control.

Presetting channels automatically

1 Press MENU to display the main menu.

2 Move the cursor (▶) to "PROGRAMME PRESET" with + ◊ or – ◊ and press OK.
The PROGRAMME PRESET menu appears.

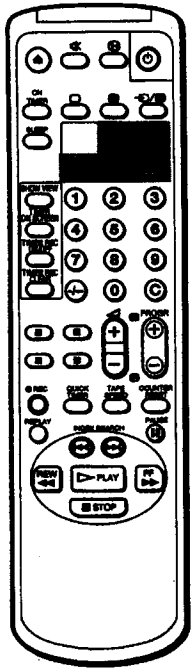
3 Move the cursor (▶) to "AUTO PROGRAMME" with + ◊ or – ◊ and press OK.
The AUTO PROGRAMME menu appears.



4 Press OK.
The programme number you previously watched appears in red in the "PROG" position.
Using + ◊ or – ◊, select the programme number from which you want to start presetting and press OK. You cannot begin presetting at 00.
The CH position turns red.

5 Select the channel with + ◊ or – ◊ and press OK.
The video TV starts scanning and presetting all receivable channels from the programme number selected in step 4.
The preset programme and channel numbers are displayed on the screen in sequence. When presetting is finished, the original screen reappears.
All available channels are now stored on successive number buttons.

GB



For programme positions beyond 6

The display scrolls by pressing – ◊ repeatedly.

If you have made a mistake

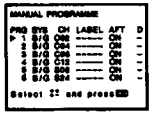
Press ⇐ to return to the previous position.

Presetting channels manually

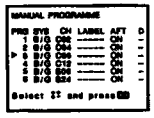
1 Press MENU to display the main menu.

2 Move the cursor (▶) to "PROGRAMME PRESET" with + ◊ or – ◊ and press OK.
The PROGRAMME PRESET menu appears.

3 Move the cursor (▶) to "MANUAL PROGRAMME" with + ◊ or – ◊ and press OK.
The MANUAL PROGRAMME menu appears.



4 Using + ◊ or – ◊, move the cursor (▶) to the programme position (number button) to which you want to preset the channel, and press OK.
The "SYS" position turns red.



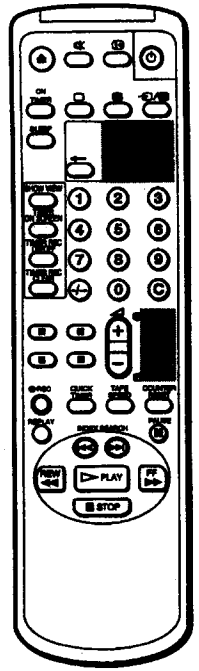
5 Select the system with + ◊ or – ◊ and press OK.
The CH position turns red.

6 Select the channel you want to preset with + ◊ or – ◊ and press OK.

7 The video TV starts scanning receivable channels. When the channel is found, it stops. If you want to preset this channel, press OK. If not, press + ◊ or – ◊ to search for another channel.

8 Repeat steps 4 through 7 to preset other channels.

9 After you finish presetting, press MENU to return to the original screen.



For programme positions beyond 6

The display scrolls by pressing – ◊ repeatedly.

Skipping programme positions

You can skip unused programme positions when selecting programmes with PROGR +/– buttons.

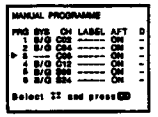
1 Press MENU to display the main menu.

2 Move the cursor (▶) to "PROGRAMME PRESET" with + ◊ or – ◊ and press OK.
The PROGRAMME PRESET menu appears.

3 Move the cursor (▶) to "MANUAL PROGRAMME" with + ◊ or – ◊ and press OK.
The MANUAL PROGRAMME menu appears.

4 Using + ◊ or – ◊, move the cursor (▶) to the programme position which you want to skip and press OK.
The "SYS" position turns red.

5 Press + ◊ or – ◊ until "—" appears in the "SYS" position and press OK.



When you select programmes using the PROGR +/– buttons, the programme position is skipped.

6 Repeat steps 4 and 5 to skip other programme positions.

7 Press MENU to return to the original screen.

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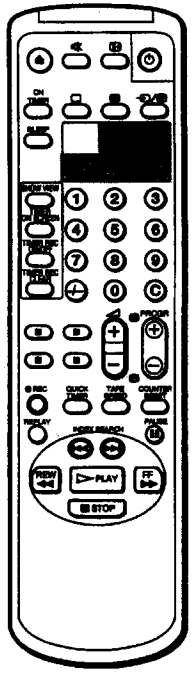


If you have made a mistake
Press ⇐ to return to the previous position.

Captioning a TV station name

You can name a channel using up to five characters (letters or numbers) to be displayed on the TV screen (e.g. MTV). Using this function, you can easily identify which channel you are watching.

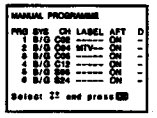
1 Press MENU to display the main menu.

2 Move the cursor (▶) to "PROGRAMME PRESET" with + ◊ or – ◊ and press OK.
The PROGRAMME PRESET menu appears.

3 Move the cursor (▶) to "MANUAL PROGRAMME" with + ◊ or – ◊ and press OK.
The MANUAL PROGRAMME menu appears.

4 Using + ◊ or – ◊, move the cursor (▶) to the programme position you want to caption and press OK repeatedly until the first element of the "LABEL" position turns red.

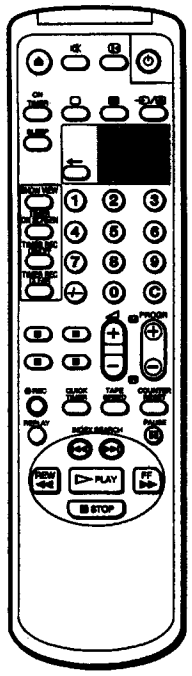
5 Select a letter or number with + ◊ or – ◊ and press OK.
The next element turns red. Select other characters in the same way. For the element you want to leave blank, select "-" and press OK.



6 After selecting all the characters, press OK repeatedly until the cursor appears. Now the caption you chose is stored.

7 Repeat steps 4 through 6 to caption other channels.

8 Press MENU to return to the original screen.



To reactivate automatic fine-tuning (AFT)
Repeat from the beginning and select "ON" in step 5.

Manual fine-tuning

Normally, the automatic fine-tuning (AFT) is already working. However, if the picture of a programme is distorted, you can use the manual fine-tuning function to obtain better picture reception.

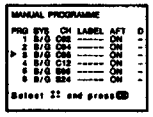
GB

1 Press MENU to display the main menu.

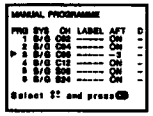
2 Move the cursor (▶) to "PROGRAMME PRESET" with + ◊ or – ◊ and press OK.
The PROGRAMME PRESET menu appears.

3 Move the cursor (▶) to "MANUAL PROGRAMME" with + ◊ or – ◊ and press OK.
The MANUAL PROGRAMME menu appears.

4 Using + ◊ or – ◊, move the cursor (▶) to the programme position which you want to manually fine-tune, and press OK repeatedly until the AFT position turns red.



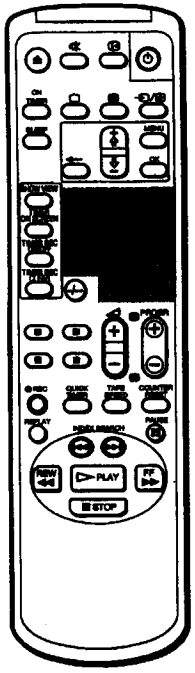
5 Fine-tune the channel while holding down + ◊ or – ◊ so that you get the best TV reception. As you press these buttons, the frequency changes from –15 to +15.



6 After fine-tuning, press OK.
The cursor (▶) appears. The fine-tuned level is now stored.

7 Repeat steps 4 through 6 to fine-tune other channels.

8 Press MENU to return to the original screen.



Tuning in to a channel temporarily

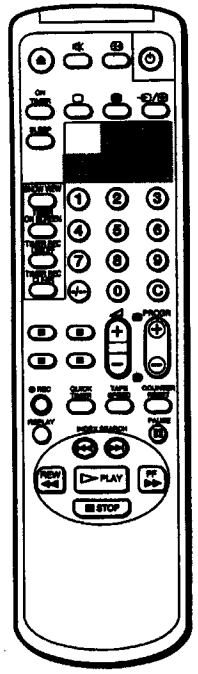
You can tune in to a channel temporarily, even when the channel has not been preset.

1 Press C on the remote control.
To tune in to a cable channel, press C twice. The indication "C" (for VHF/UHF channels), or "S" (for cable channels) will appear on the screen.

2 Enter the double digit channel number using the remote control number buttons (e.g. for channel 4, press 0, then 4).
The channel will appear. However, this channel will not be stored in the video TV's memory.

Note (KV-21V6D only)

In order to record a programme received through a Pay-TV decoder, you must preset the channel according to the method on page 8 "Presetting channels manually", or page 13 "Setting a pay-TV channel," and then tune in to the channel according to the method on page 17 "Selecting TV programmes".



Setting a Pay-TV channel (KV-21V6D only)

You can watch Pay-TV channels by connecting a Pay-TV decoder to the ⊡1/-⊡1 connector on the rear of the video TV.

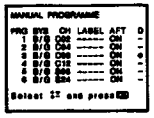
1 Press MENU to display the main menu.

2 Move the cursor (▶) to "PROGRAMME PRESET" with + ◊ or – ◊ and press OK.
The PROGRAMME PRESET menu appears.

3 Move the cursor (▶) to "MANUAL PROGRAMME" with + ◊ or – ◊ and press OK.
The MANUAL PROGRAMME menu appears.

4 Move the cursor (▶) to the programme position to which you want to set the pay-TV decoder, and press OK until the D position turns red.

5 Press + ◊ or – ◊ until ● appears in the D position and press OK.

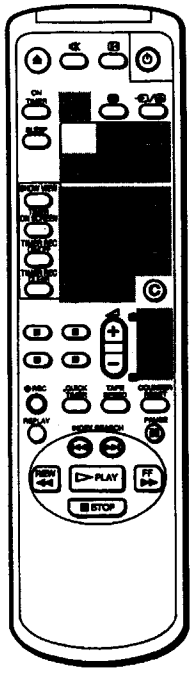


6 Press MENU to return to the original screen.

Note

While you are recording a program which is being recorded through the Pay-TV decoder, you will not be able to view other programmes through the decoder.

Step 4 — Setting up ShowView Manually



If you have made a mistake
Press ⇦ to return to the previous position.

The ShowView function allows you to simplify the task of programming your video TV to make timer recordings. You should coordinate the programme position of each channel with the guide channel (the number that's assigned to each TV station in advance). To find the guide channel numbers, look in the programme guide for your area that features ShowView numbers.

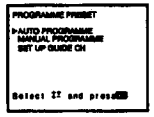
Before you begin

- If the ⏻ lamp on the video TV is lit in red (indicating that the video TV is in standby mode), press ⏻, PROGR +/– or a number button on the remote control.

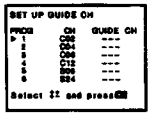
Setting the guide channels

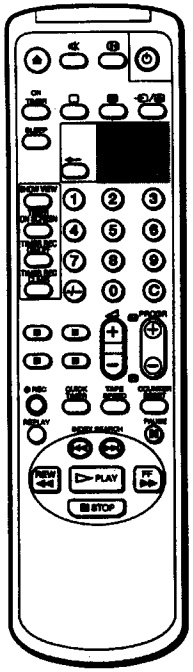
1 Press MENU to display the main menu.
The main menu appears.

2 Move the cursor (▶) to "PROGRAMME PRESET" with + ◊ or – ◊ and press OK.
The PROGRAMME PRESET menu appears.

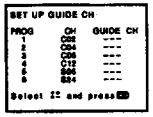


3 Move the cursor (▶) to "SET UP GUIDE CH" with + ◊ or – ◊ and press OK.
The SET UP GUIDE CH menu appears.

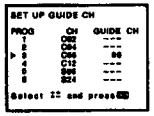




4 Using + ◊ or – ◊, move the cursor (▶) to the programme position (number button) to which you want to preset the guide channel, and press OK.
The GUIDE CH position turns red.



5 Select the guide channel you want to preset with + ◊ or – ◊, and press OK.



6 Repeat steps 4 and 5 to preset other channels.

7 After you finish presetting, press MENU to return to the original screen.

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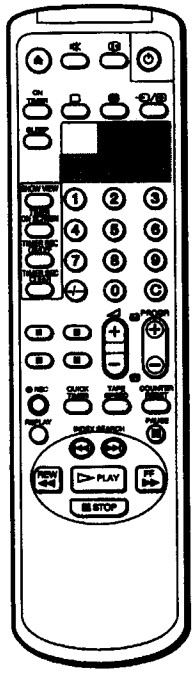
Step 5 — Setting the Clock

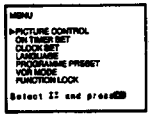


If you have made a mistake
Press ⇦ to return to the previous position.

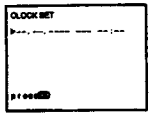
If the clock has stopped and "-:-" is displayed
You have to re-set the clock.

You need to set the clock in order to use timer recording and quick-timer recording functions.

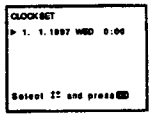
1 Press MENU to display the main menu.



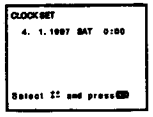
2 Move the cursor (▶) to "CLOCK SET" with + ⇳ or – ⇳ and press OK.
The CLOCK SET menu appears.



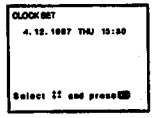
3 Press OK to start setting the clock.
The day section turns red.



4 Set the day with + ⇳ or – ⇳ and press OK.
The month section turns red.



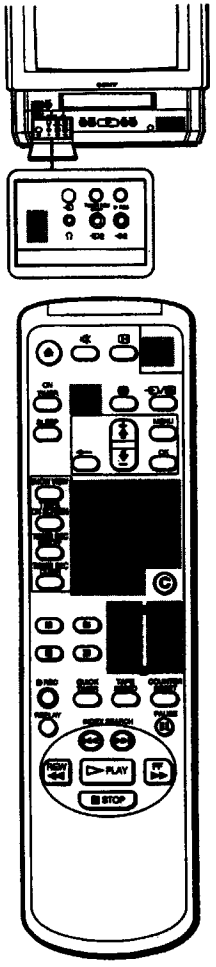
5 Using + ⇳ or – ⇳ and OK, set the month, year, hour and minute in the same way as in step 4.



6 After setting the minute, press OK.
The clock starts working.

7 Press MENU to return to the original screen.

Watching the TV



Note
When the ⏻ switch is turned off, the video operations do not work.

This section explains the basic functions you use while watching the TV. Most of the operations can be done using the remote control.

Switching the video TV on and off

Switching on

Depress the ⏻ (MAIN POWER) switch, which is located behind the cover on the front of the video TV.
Press ▭, PROGR +/– or number buttons on the remote control, or PROGR +/– on the video TV when the ⏻ lamp is lit in red (indicating that the video TV is in standby mode).

Switching off temporarily

Press ⏻.
The video TV enters standby mode and the ⏻ lamp on the front of the video TV lights up in red.

To switch on again
Press ▭, PROGR +/– or number buttons on the remote control, or PROGR +/– on the video TV.

To switch off the main power
Press the ⏻ switch on the video TV.

Selecting TV programmes

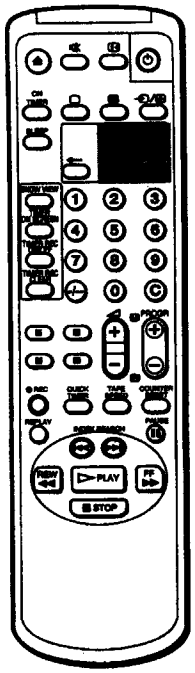
Press PROGR +/– or number buttons on the remote control, or PROGR +/– on the video TV.

To select a double-digit number using the number buttons

Press -/--, then the numbers.
For example, if you want to choose 14, press -/--, 1 and 4.

Adjusting the volume

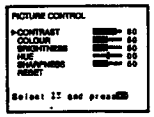
Press ◿ +/–.



Adjusting the picture

1 Press MENU to display the main menu.

2 Move the cursor (▶) to "PICTURE CONTROL" with + ⇕ or – ⇕ and press OK.
The PICTURE CONTROL menu appears.



3 Using + ⇕ or – ⇕, select the item you want to adjust and press OK.

4 Adjust the picture with + ⇕ or – ⇕ and press OK.
With each press the vertical bars increase or decrease and the figure at the right margin changes to show the control level. (See the table below.)

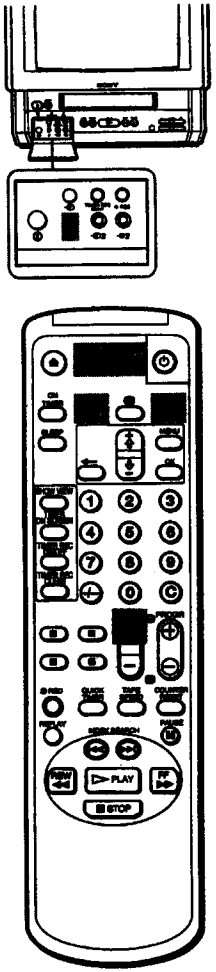
5 Repeat steps 3 and 4 to adjust other items.

6 Press MENU to return to the original screen.
The adjusted control levels are stored.

Effect of each control

PICTURE CONTROL	Effect	
CONTRAST	Less	More
COLOUR	Less	More
BRIGHTNESS	Darker	Brighter
HUE	Greenish	Reddish
SHARPNESS	Softer	Sharper
RESET	Resets all the items to the factory preset levels.	

Note
The HUE adjustment is available only for the NTSC colour system.



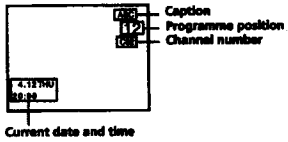
Muting the sound

Press 🔇.
The 🔇 indicator appears and stays on the screen.
To resume normal sound, press 🔇 again or 🔊 +.

GB

Displaying the on-screen information

Press ⊡ to display the following on-screen information.
To have the programme number, channel number and caption stay on the screen, press ⊡ again.
To make the indications disappear, press ⊡ until no indications are displayed on the screen.



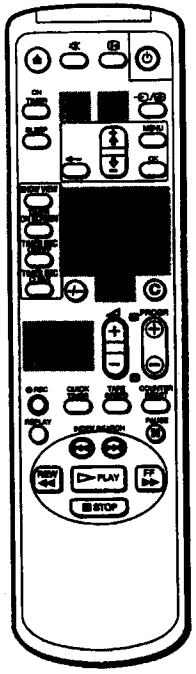
Watching line input

Press -⊖ repeatedly until the desired input indicator appears.
To return to the normal TV picture, press -⊖ until the programme position appears, or press ▢ on the remote control once. For details of the video input picture, see page 42.

Listening with headphones

Plug the headphones (not supplied) into the ∩ (headphones) jack which is located behind the cover on the front of the video TV.
The sound from the speaker is turned off.

Viewing Teletext



TV stations broadcast an information service called Teletext via the TV channels. The Teletext service allows you to receive various information, such as weather forecasts or news, at any time.

Switching Teletext on and off

1 Select the TV channel which carries the Teletext service you want to watch.

2 Press ⊜ to display Teletext.
A Teletext page (normally the index page) is displayed. If there is no Teletext broadcast, the indication P100 is displayed on a black screen.

3 Press the number buttons to enter the three digits of the Teletext number you want.
The numbers are displayed on the screen and the requested page appears in a few seconds.
If you have made a mistake, type in any three digits, then re-enter the correct page number.

4 Press ▢ to return to the TV mode.

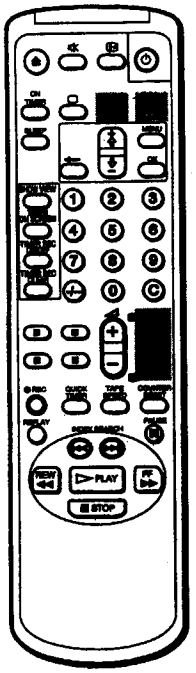
Using Fasttext

This feature allows you to access a Teletext page by pressing only one button. When a Fasttext page is broadcast, a colour-coded menu appears at the bottom of the screen. The colours of the menu correspond to the red, green, yellow and blue buttons on the remote control. These coloured buttons function as the Fasttext buttons in Teletext mode.

Press the coloured button which corresponds to the colour-coded menu.
The page is displayed after a few seconds.

To change the Teletext channel

- First press ▢ to return to the TV mode, then repeat steps 1 through 3.
- If the signal of a TV channel is weak, Teletext errors may occur.



Accessing the next or preceding page

Press PROGR +/–/⊜/⊜.
The next or preceding page appears on the screen.

Superimposing a Teletext page on the TV picture

Each time you press ⊜, the screen changes as follows:

→ Teletext → Teletext and TV →

Preventing a Teletext page from being updated or changed

A Teletext page may consist of several subpages. You can stop the page scrolling in order to read the text at your own pace.

Press ⊕ (HOLD).
The symbol ⊕ appears on the screen and the selected subpage is held.

Press ⊕ again to return to normal Teletext operation.

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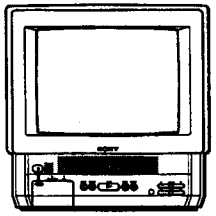
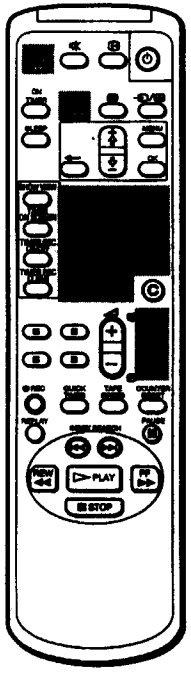
– 11 –

Playing a Tape





This section shows you how to insert a video cassette and to play it. More convenient functions you can use while playing a tape are described in "Additional Operations" on page 36.

Inserting a video cassette

1 Press ▢, PROGR +/– or number buttons on the remote control, or PROGR +/– on the video TV when the ⏻ lamp is lit in red (indicating that the video TV is in standby mode).

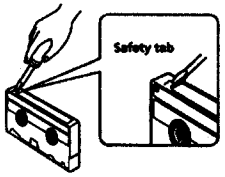
2 Gently insert a cassette with the arrow indication facing upwards. The cassette is automatically loaded into the cassette compartment.
The ⏏ indicator appears on the screen and stays until the cassette has been loaded.
The video TV turns on automatically when it is in standby mode. If you insert a cassette with its safety tab removed, playback starts.

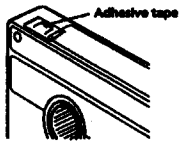
Ejecting a video cassette

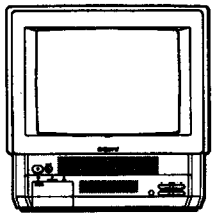
Press EJECT ≙ on the video TV or ≙ on the remote control.
The ⏏ indicator appears and stays until the cassette is ejected.
You can eject the cassette even if the power is in standby.

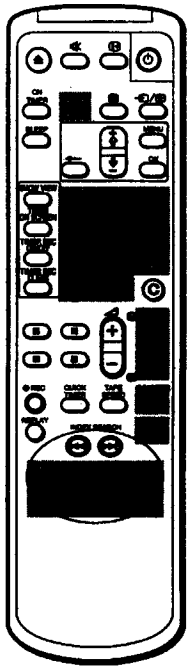
Protecting your cassette against accidental erasure

The cassette is provided with a safety tab to protect against accidentally erasing a previous recording. Break off the safety tab with a screw driver or a similar tool to prevent recording.
If the safety tab is removed, the cassette is ejected when you try to record on it.
To record on a cassette with the safety tab broken off, simply cover the tab hole with adhesive tape.









Playing a tape

1 If the ⏻ lamp on the video TV is lit in red (indicating that the video TV is in standby mode), press ▢, PROGR +/– or a number button on the remote control.

2 Insert the tape.
If you insert a tape with the safety tab removed, playback begins immediately.

3 Press PLAY ▷.
Playback begins. On-screen information will automatically disappear after several seconds.

To stop playback
Press STOP ■.
The video TV returns to the normal TV picture.

To stop playback for a moment
Press PAUSE ⏸. The picture pauses.
Press PAUSE ⏸ again or press PLAY ▷ to resume playback.
If you leave your video TV in pause mode, normal playback resumes after about 5 minutes.

To fast forward the tape
Press STOP ■, then press FF ▶▶.

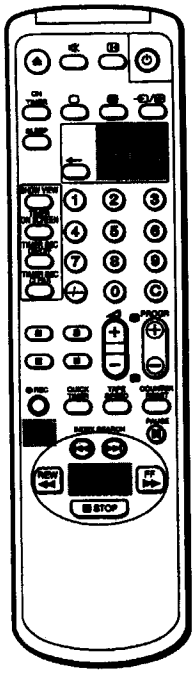
To rewind the tape
Press STOP ■, then press REW ◀◀.

To search a tape at high speed
During playback, press and hold REW ◀◀ (rewind) or FF ▶▶ (fast forward). A high-speed picture appears on the TV screen.
To resume normal playback, release the button.

To view the picture in fast forward or rewind mode
Press and hold FF ▶▶ during fast forward or REW ◀◀ during rewind.
While you hold the button, you can view the picture.
When you release the button, fast forward or rewind mode is resumed.

Resetting the tape counter

The tape counter helps you to locate a certain scene after playback. Press COUNTER RESET on the remote control to set the counter to "0:00:00" before playing the tape. The tape counter is automatically reset to "0:00:00" whenever a cassette is inserted. The video TV keeps counting the length of the tape being played. Note, however, that the tape counter does not count the portions without video signals recorded.

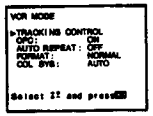


Playing a tape repeatedly (AUTO REPEAT)

You can play the recorded portion of a tape repeatedly.

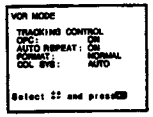
1 Press MENU.
The main menu appears.

2 Using the + ◊ or – ◊ buttons, move the cursor (▶) to "VCR MODE," then press OK.



3 Using the + ◊ or – ◊ buttons, move the cursor (▶) to "AUTO REPEAT," then press OK.

4 Using the + ◊ or – ◊ buttons, select ON.



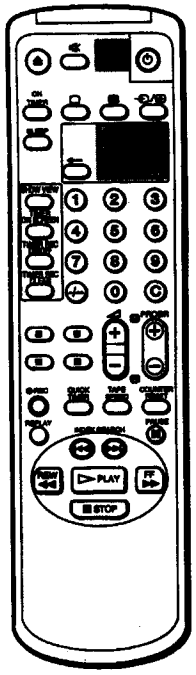
5 Press PLAY ▷.
Playback begins. When the tape reaches its end, it will automatically rewind and begin playing again.

Replaying a scene automatically

You can use the REPLAY key on your remote control to automatically replay scenes.

Press REPLAY.
The tape will rewind for ten seconds of viewing time and then begin playing automatically.

If you wish to replay more than ten seconds, press REPLAY repeatedly. Each time you press the button, it will add ten seconds onto the playing time, up to a total of 40 seconds.



Note
The tape operation mode will be displayed whenever you change the mode (even when the ⊞ is turned off.)

Setting the colour system

Normally, you will want to leave the colour system on AUTO. However, if you notice streaks appearing on the screen during playback, you may want to set the colour system to the system that the tape was recorded in.

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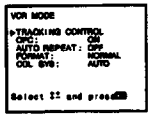
1 Press MENU.
The main menu appears.

2 Using the + ◊ or – ◊ buttons, move the cursor (▶) to "VCR MODE," then press OK.



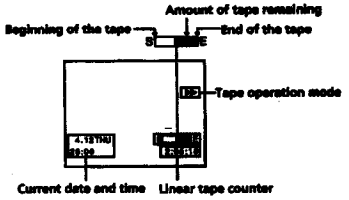
3 Using the + ◊ or – ◊ buttons, move the cursor (▶) to "COL SYS," then press OK.

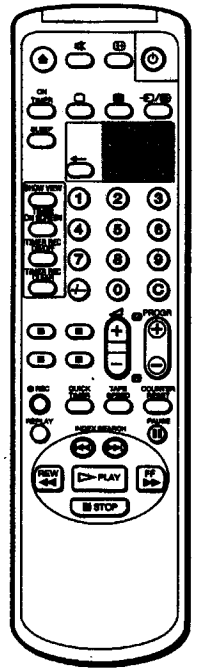
4 Press the + ◊ or – ◊ buttons until the corresponding colour system appears (PAL or NTSC), then press OK.

5 Press MENU to return to the original screen.

Displaying the on-screen indications

Press ⊞ to display the following on-screen information. To show only the amount of tape remaining and linear tape counter on the screen, press ⊞ again.
To make the indications disappear, press ⊞ until no indications appear.



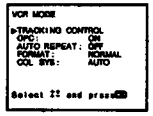


Viewing programmes in 16:9 mode

When viewing recordings of programmes which were originally broadcast in 16:9 mode, you will want to set your video TV to 16:9 mode to prevent a distorted picture.

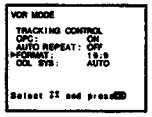
1 Press MENU.
The main menu appears.

2 Using the + ◊ or – ◊ buttons, move the cursor (▶) to "VCR MODE," then press OK.



3 Using the + ◊ or – ◊ buttons, move the cursor (▶) to "FORMAT," then press OK.

4 Press the + ◊ or – ◊ buttons, select 16:9, then press OK.

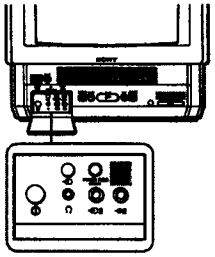


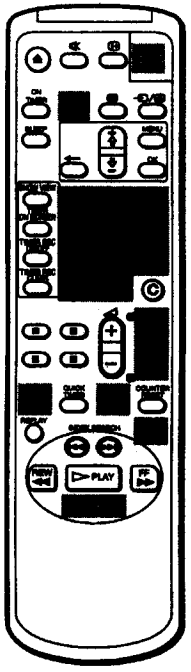
5 Press MENU to return to the original screen.

Note

When you change channels, switch between input sources, or turn the power on and off, the video TV will switch back to normal mode.

Recording TV Programmes





Note (KV-21V6D only)

In order to record a Pay-TV programme, you must set the desired Pay-TV channel as explained in "Setting a Pay-TV channel" (page 13).

Recording TV programmes

1 Press ⎕, PROGR +/– or number buttons on the remote control, or PROGR +/– on the video TV when the ⏻ lamp is lit in red (indicating that the video TV is in standby mode).

2 Insert a cassette with a safety tab.

3 Press TAPE SPEED to select the recording speed, SP (Standard Play), or LP (Long Play). Recording in LP mode will extend the length of your tape.
Maximum recording time
SP mode: 4 hours with E-240
LP mode: 8 hours with E-240

4 Select the programme position with PROGR +/–. You can also use number buttons on the remote control. For double-digit numbers (e.g. 14), first press -/--, then press 1 and 4.

5 Press REC ●.
The REC lamp on the front of the video TV lights up and recording begins.

To stop recording

Press STOP ■.
When the tape reaches the end, the video TV rewinds the tape automatically to the beginning, then stops. This function does not work when the power of the video TV is off.

To pause recording

Press PAUSE ❚❚.
To resume recording, press PAUSE ❚❚ again.

You can cut out an unwanted scene during recording with this button.
1 Press PAUSE ❚❚ when an unwanted scene appears on the screen.
Recording pauses.
2 Press PAUSE ❚❚ again to release the pause mode at the desired scene.
Recording resumes from the point set in step 1.

When the recording pause mode lasts for about 5 minutes, the video TV stops recording.

Recording with the TV off

Press ⏻.
The TV screen is turned off and the ⏻ lamp lights up.
The video TV continues recording.

Watching a TV programme while recording another (KV-21V6D only)

You can watch a TV programme and record another at the same time if your video TV has two tuners. Only models KV-14V6D and KV-21V6D are equipped with two tuners.

Select the desired programme position with PROGR +/– or the number buttons on the remote control or PROGR +/– on the video TV.

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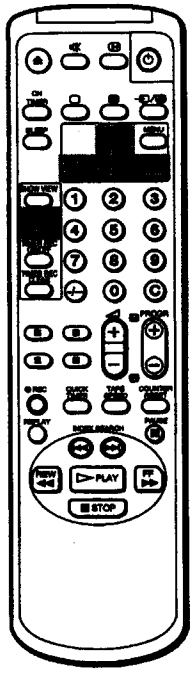
Recording TV Programmes Using the Timer



If you have made a mistake during timer setting

Press ⇦ to return to the previous position and correct the setting.

If you try to enter the recording start time prior to the current time

All the items of the setting will be erased.

The Timer Recording function allows you to preset your video TV to record up to six programmes within a one-month period.

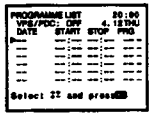
Before you begin

- Press ⏻, PROGR +/– or number buttons on the remote control, or PROGR +/– on the video TV to switch on the video TV.
- Make sure that the time and date clock are set. If not, the message "Please set the time" is displayed on the screen. Refer to "Setting the clock" on page 16.
- Make sure that the loaded cassette has its safety tab. If a cassette without safety tab is loaded, the message "Tape with safety tab is required for recording" is displayed.
- If you are using an indoor aerial, adjust the reception for the channel you want to record.

Setting the timer

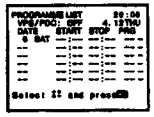
Example: Here is how to record a programme broadcast on programme position 26 from 20:15 to 21:55 on Saturday, 6th December 1997, in SP mode.

1 Press TIMER ON SCREEN.
The PROGRAMME LIST appears.

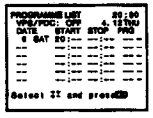


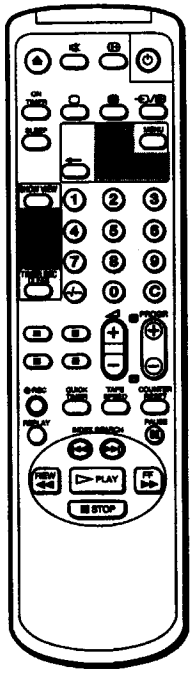
2 Press OK.
Today's date coloured red appears.

3 Press + ◊ until "6 SAT" appears.
For daily and weekly recording see "Daily/weekly recording" on page 30.



4 Press OK, then set the hour of the recording start time to "20" with + ◊ or – ◊.





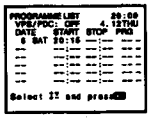
If you try to do an incorrect operation

The video TV displays a message on the screen to interrupt your setting.

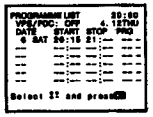
If you turn the ⏻ switch off

The TIMER REC buttons do not function.

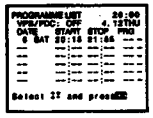
5 Press OK, then set the minute of the recording start time to "15" with + ◊ or – ◊.



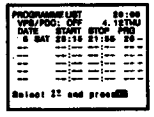
6 Press OK, then set the hour of the recording stop time to "21" with + ◊ or – ◊.



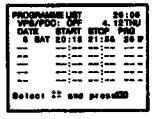
7 Press OK, then set the minute of the recording stop time to "55" with + ◊ or – ◊.



8 Press OK, then set the programme position to "26" with + ◊ or – ◊.



9 Press OK, then set the recording speed to SP, using the + ◊ or – ◊ buttons.



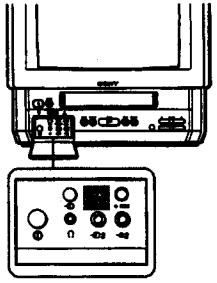
10 Press OK.
The cursor (▶) appears at the left margin.

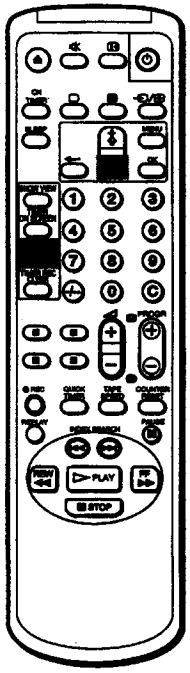
11 When you want to set other programmes, press – ◊ to move the cursor to the next line, then repeat steps 2 through 10.

12 Press TIMER REC ON/OFF.
The TIMER REC lamp on the front of the video TV lights up and the video TV enters timer recording standby mode.

Press TIMER ON SCREEN to erase the PROGRAMME LIST.
Press ⏻ to turn the video TV off if you do not want to watch the TV.
The video TV turns on automatically and starts recording at the preset start time, and goes off at the preset stop time.

GB





Daily/weekly recording

You can preset your video TV to record the same programme every day of the week (daily recording) or the same programme on the same day every week (weekly recording). Press – ◊ in step 3 until the desired setting appears in the "DATE" position. With each press, the setting changes as follows:

4 (today) → MON–SUN → MON–SAT → MON–FRI → EVERY SAT → EVERY FRI → EVERY THU → EVERY WED → EVERY TUE → EVERY MON → EVERY SUN → 3 (next month) → 2.....

To stop timer recording

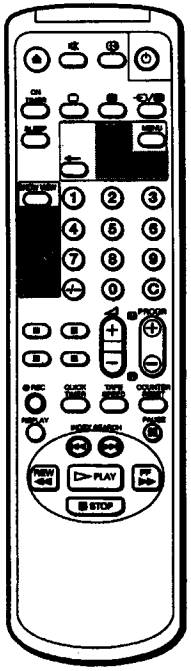
Press TIMER REC ON/OFF.
The TIMER REC lamp turns off.

Using the video TV before timer recording starts

You can watch a TV programme, check the timer settings and reset the counter in timer recording standby mode. However, press TIMER REC ON/OFF to turn off the TIMER REC lamp on the front of the video TV to do the following operations:

- eject the cassette
- use the tape operation buttons
- change or cancel the timer settings

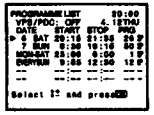
Remember to press TIMER REC ON/OFF again to make the TIMER REC lamp light after the above operations.



Checking the timer settings

You can display the list of the timer settings which you preset.

Press TIMER ON SCREEN.
The PROGRAMME LIST appears.



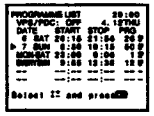
Press TIMER ON SCREEN again to erase the PROGRAMME LIST.

Changing or cancelling the timer settings

1 Press TIMER REC ON/OFF to turn off the TIMER REC lamp on the front of the video TV.

2 Press TIMER ON SCREEN to display the PROGRAMME LIST.

3 Select the setting you want to change or cancel with + ◊ or – ◊.



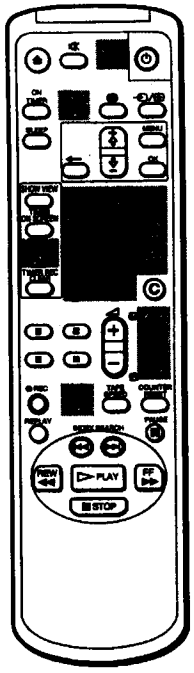
4 **To change the setting**
Using + ◊ or – ◊ and OK, re-enter all the items.
Refer to "Setting the timer" steps 2 through 10 on pages 28 and 29.

To cancel the setting
Press TIMER REC CLEAR.

5 Press TIMER ON SCREEN to return to the original screen.

6 If there are other timer settings on the list, press TIMER REC ON/OFF to set the video TV to timer recording standby mode.

GB



To change the recording time period after QUICK TIMER recording begins

Press QUICK TIMER until the desired time period appears.

To display the remaining time period during QUICK TIMER recording

Press ⊡. The recording time period decreases minute by minute.

To stop QUICK TIMER recording

Press TIMER REC ON/OFF.

Recording using QUICK TIMER

You can preset your video TV to start timer recording immediately and to automatically stop recording after a specific time period.
If you have not set the clock, QUICK TIMER recording cannot be used.

If you are recording

1 Press QUICK TIMER on the remote control.
"QUICK TIMER 0:00" appears on the screen.

2 Press QUICK TIMER repeatedly to select the recording time period. With each press, the time period changes as follows:

0:00 → 0:30 → 1:00 → .... → 7:30 → 8:00

Even if you switch off the video TV, it continues recording. After the selected time period has elapsed, recording stops automatically.

If you are not recording

1 Press ⊡, PROGR +/– or number buttons on the remote control, or PROGR +/– on the video TV to switch it on.

2 Insert a cassette with its safety tab.

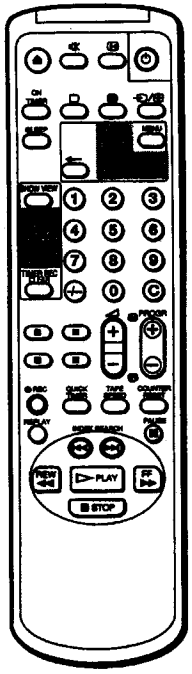
3 Select the programme position which you want to record.

4 Press QUICK TIMER on the remote control.
"QUICK TIMER 0:00" appears on the screen.

5 Press QUICK TIMER repeatedly to select the recording time period. With each press the time period changes as follows:

0:00 → 0:30 → 1:00 → .... → 7:30 → 8:00

The time period turns yellow and recording starts.
Even if you switch off the video TV, it continues recording.
When the preset time period has elapsed, the video TV stops recording.



Notes on VPS/PDC recording

- If recording times overlap due to a VPS/PDC time shift, the programme that was broadcast first has priority. Recording of the second programme begins when the first programme has finished.
- If the video TV could not receive a VPS/PDC signal because it was too weak or because the station failed to transmit VPS/PDC signals, timer recording is made without the VPS/PDC function.
- (KV-21V5D only)
If you use VPS/PDC recording while watching the TV, the programme automatically changes to the timer recording programme and you cannot change programmes. Make sure to use VPS/PDC recording only when the video TV is in standby mode. If you watch the TV continuously, cancel the VPS/PDC timer recording.

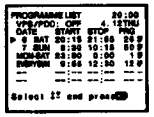
Timer recording with VPS/PDC signals

The German broadcasting system transmits VPS (Video Programme System) signals or PDC (Programme Delivery Control) signals with the TV programmes. These signals assure you that your timer recordings are made regardless of broadcast delays, early starts, or broadcast interruptions. For example, if an urgent news bulletin interrupts a regular programme, recording stops. As soon as the interrupted programme resumes, recording starts again.

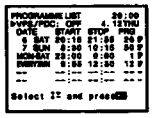
GB

1 If the TIMER REC lamp is lit on the front panel, press TIMER REC ON/OFF to turn it off.

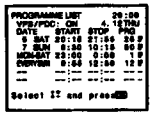
2 Press TIMER ON SCREEN.
The PROGRAMME LIST screen appears.



3 Using the + ⇳ or – ⇳ buttons, select VPS/PDC, then press OK.
VPS/PDC will turn red.

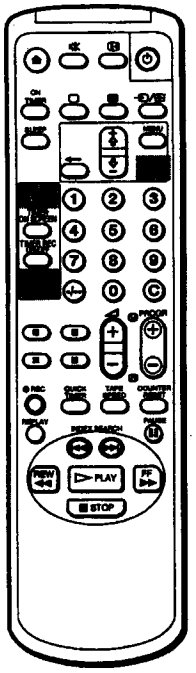


4 Using the + ⇳ or – ⇳ buttons, select ON, then press OK.



5 Set the timer following the steps in "Setting the timer" (pages 28 and 29).

Recording TV Programmes Using ShowView



If you have made a mistake entering programme's ShowView number

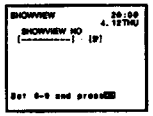
Press TIMER REC CLEAR and re-enter the correct number.

The ShowView function allows you to simplify the task of making timer recordings. Using ShowView, you can make all the necessary settings by just entering the desired programme's 9-digit code, which is available in your local programme guide. To take advantage of this function, you must first set up your video TV and assign programme positions to the various guide channels. For details, see "Setting up ShowView manually" on page 14.

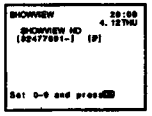
Before you begin

- Press ⏻, PROGR +/– or a number button on the remote control, or PROGR +/– on the video TV to switch on the video TV.
- Make sure that the time and date clock are set correctly. If not, refer to "Setting the clock" on page 16.
- Make sure that the loaded cassette has its safety tab.

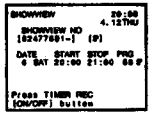
1 Press SHOWVIEW.
The SHOWVIEW menu appears.



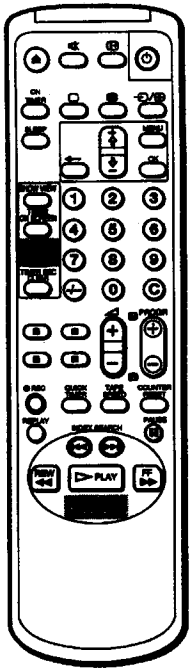
2 Press the number buttons to enter the desired programme's ShowView number.



3 Press OK.
The recording information appears: date, start and stop times, programme position number.



Check that the information is correct. If it is not, press TIMER REC CLEAR to cancel the setting.



4 Repeat steps 2 to 3 to preset another timer setting.

5 Press TIMER REC ON/OFF.
The TIMER REC lamp on the front of the video TV lights up and the video TV enters timer recording standby mode.

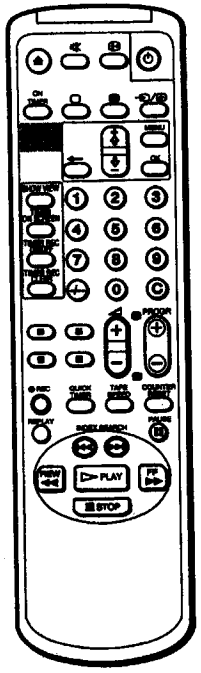
To stop recording

To stop the video TV while recording a programme, press STOP ■.

GB

– 18 –

Switching Off Automatically — Sleep Timer



You can automatically switch the video TV into standby mode after a selected time period.

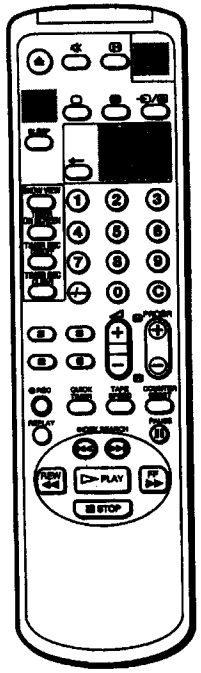
Press SLEEP.
With each press, the time period (in minutes) changes as follows:

OFF → 30 → 60 → 90

One minute before the TV switches into standby mode, a message "Good night" is displayed on the screen.

To cancel the timer
Press SLEEP to select "OFF".

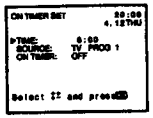
Switching On at Your Desired Time — On Timer



You can preset your video TV to automatically switch on at a desired time. You can choose either a TV programme or video playback to be switched on.

1 Press MENU to display the main menu.

2 Move the cursor (▶) to "ON TIMER SET" with + ◊ or – ◊ and press OK.
The ON TIMER SET menu appears.



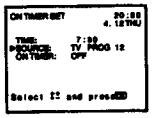
3 Press OK.
The timer setting hour section turns red.

4 Set the hour with + ◊ or – ◊ and press OK.
The minute section turns red.

5 Set the minutes (by one minute) with + ◊ or – ◊ and press OK.
The cursor appears beside "TIME."

6 Move the cursor (▶) to "SOURCE" with + ◊ or – ◊ and press OK.

7 Select TV or VCR (video playback) with + ◊ or – ◊ and press OK.
When you select TV, select the programme position with + ◊ or – ◊ and press OK.



8 Move the cursor (▶) to "ON TIMER" with + ◊ or – ◊ and press OK, then select ON with + ◊ or – ◊ and press OK.

9 Press MENU to return to the original screen.

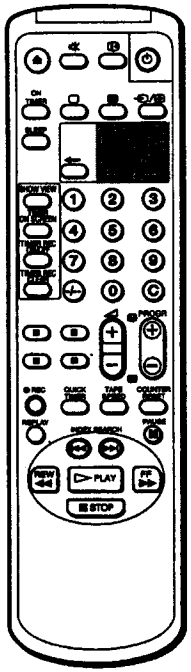
10 Press ON TIMER.
If you are not using the video TV, press ⏻ to set the video TV in standby mode.

At the preset time, the video TV automatically switches on.
If you do not press any button for 2 hours, the video TV automatically shuts off.

To erase the message
Press any button on the video TV or remote control.

GB

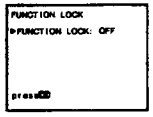
Using FUNCTION LOCK



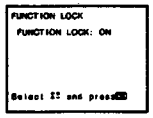
The FUNCTION LOCK feature prevents use of the buttons on the front of the video TV. You may want to use this feature to prevent small children from changing channels, viewing video tapes, etc.

1 Press MENU.
The main menu appears.

2 Using the + ◊ or – ◊ buttons, move the cursor (▶) to "FUNCTION LOCK," then press OK.
The FUNCTION LOCK menu appears.

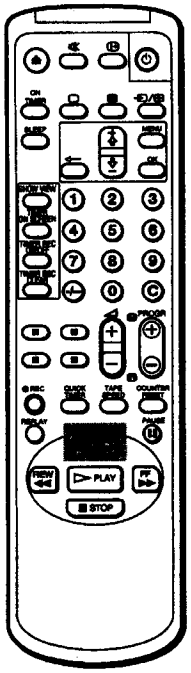


3 Press OK to start setting the FUNCTION LOCK.
The ON/OFF section turns red.
Using + ◊ or – ◊ buttons, select OFF or ON, then press OK.
OFF: Factory setting.
ON: The buttons on the video TV will no longer function (except the POWER button).



The remote control will still operate even if the FUNCTION LOCK is activated.

Searching Using the INDEX Function



The video TV marks the tape with an index signal at the point where each recording begins. These signals can be used to find a specific recording. Your video TV is capable of searching 99 signals forward or backward on a tape.

1 Insert the tape.

2 Press INDEX SEARCH ⏮ / ⏭ repeatedly to specify how many index signals ahead or behind you want to search.

The video begins searching, and the index number will appear on the screen, counting down to zero. When zero is reached, playback begins automatically.

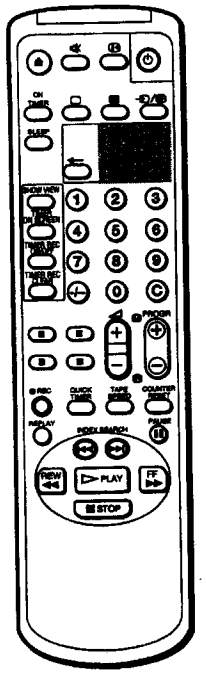
To stop searching

Press STOP ■.

GB

– 20 –

Enhancing Video Picture Quality



Adjusting the tracking

Adjusting the tracking automatically

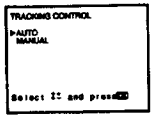
The tracking condition is automatically adjusted on this video TV. The AUTO TRACKING indicator will appear while the video TV is searching for the best tracking condition.

Adjusting the tracking manually

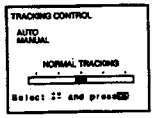
If streaks or snow noise appear on the video playback picture, adjust the tracking condition manually.

1 Press MENU to display the main menu.

2 Move the cursor (▶) to "TRACKING CONTROL" with + ◊ or – ◊ and press OK.
The TRACKING CONTROL menu appears.



3 Select MANUAL with + ◊ or – ◊ and press OK.
The tracking meter appears.

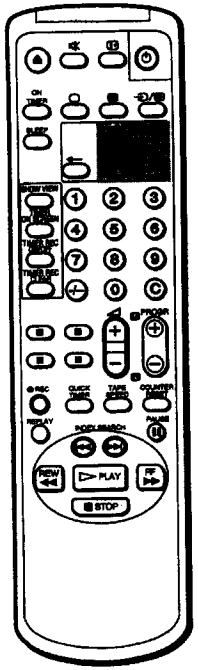


4 Using + ◊ or – ◊, adjust the tracking to get the best picture.

5 Press OK.
The main menu reappears.

6 Press MENU to return to the original screen.

To return to automatic tracking
Select AUTO in the TRACKING CONTROL menu with + ◊ or – ◊ and press OK.

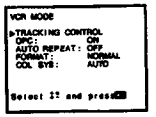


Adjusting with the optimum picture control (OPC)

This function allows you to improve playback and recording quality by adjusting the system parameter automatically according to the condition of the video tape.
This function is set to ON at the factory. To maintain better picture quality, leave the function on. The OPC function works on all types of tapes, even on rental tapes.
To change the setting, use the menu display.

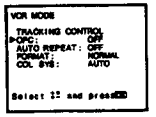
1 Press MENU to display the main menu.

2 Move the cursor (▶) to "VCR MODE" with + ◊ or – ◊ and press OK.
The VCR MODE menu appears.



3 Move the cursor (▶) to "OPC" with + ◊ or – ◊ and press OK.

4 Select ON or OFF with + ◊ or – ◊ and press OK.



5 Press MENU to erase the main menu.

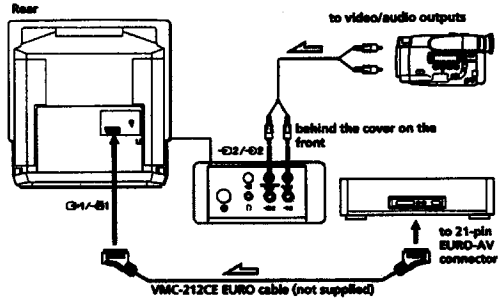
About the Auto Head Cleaner

The Auto Head Cleaner built into this set automatically cleans the video heads when a cassette is loaded or unloaded. If the effect of head cleaning is not sufficient even after a cassette has been loaded/unloaded several times, clean the heads using the Sony V-25CL video head cleaning cassette.
For details on head cleaning see page 46.

GB

Connecting Optional Equipment

Watching the picture input from optional equipment



To watch the video input signal

Press -⊖ repeatedly until the desired input indicator appears on the screen.

- -⊖ 1 for audio/video input or RGB input through the ⊖ 1/-⊖ 1 connector
- -⊖ for audio/RGB input through the ⊖ 1/-⊖ 1 connector
- -⊖ 2 for audio/video input through the -⊖ 2/-⊖ 2 jacks located behind the cover on the front of the video TV

Note

When connecting optional equipment, such as videogames, please use the connecting cables recommended by the equipment's manufacturer.

Editing with another VCR

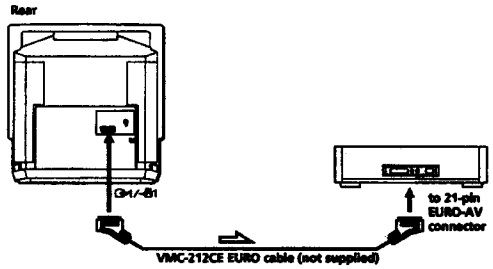
Using an additional VCR, you can edit a tape.

Editing from another VCR

Connections are the same as in "Watching the picture input from optional equipment."

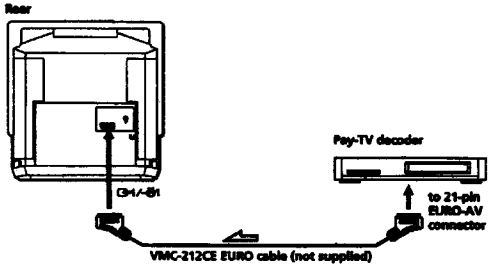
GB

Editing onto another VCR



Watching the pay-TV channel (KV-21V6D only)

You can connect the pay-TV decoder to the ⊖ 1/-⊖ 1 connector using VMC-212CE EURO cable. Set the Pay-TV decoder following the steps in "Setting a Pay-TV channel" (page 13).



Troubleshooting

Function	Problems	Possible causes and remedies
TV reception	No picture (screen is dark), no sound	• The mains lead is disconnected. ➡ Connect the mains lead. • The video TV is switched off. ➡ Press ⏻, PROGR +/– or programme number on the remote control, or PROGR +/– on the video TV.
	Good picture but no sound	• The headphones are connected to the 🎧 jack. ➡ Disconnect the headphones. • The 🔇 is displayed on the screen. ➡ Press 🔇. • Press 🔊 +/–.
	No colour or poor colour (screen is dark) for colour programmes, but good sound.	• Adjust "CONTRAST," "COLOUR," and "BRIGHTNESS" in the PICTURE CONTROL menu. (page 18)
	No picture, no sound from video input source	• The connecting cord between the video TV and the input source is disconnected. ➡ Connect it firmly. • Input is not selected correctly. ➡ Press ⏻ until the desired input indicator appears. (page 42)
Clock and timer	The clock has stopped and "–:–" is displayed.	• The power has been interrupted, the ⏻ (MAIN POWER) switch is turned off or the mains lead is disconnected for more than a week. ➡ Re-set the clock and timer settings if necessary. (pages 16, 28, 34)
Playback	Power is on, but the tape does not run.	• The safety device has been activated. ➡ Switch off, disconnect the mains lead, and leave the set for about one minute.
	Poor playback picture	• The COL SYS setting in the VCR MODE menu is not correct. ➡ Set COL SYS to the system that the tape was recorded in. (page 25) • Adjust the tracking. (page 40) • The video heads are dirty. ➡ Clean the heads using the Sony V-25CL video head cleaning tape (page 46). If the cleaning tape is not available in your area, have the heads cleaned at your nearest Sony service facility. (Do not use a commercially available wet-type cleaning tape, as it may damage the video heads.) • The tape is worn out. ➡ Use a new tape.
	The sound drops out.	• The tape is defective. ➡ Use a new tape.

Function	Problems	Possible causes and remedies
Recording	The cassette is ejected when you press REC ●.	• The safety tab of the cassette has been removed. ➡ Cover the tab hole with adhesive tape, or use another cassette with a safety tab. (page 22)
	Recording does not function.	• No cassette has been inserted. ➡ Insert a cassette with the safety tab. • The tape is at its end. ➡ Rewind the tape.
	Pay-TV programme was not recorded.	• The Pay-TV channel was not set properly. ➡ Check the setting steps. (page 13)
	You cannot view one programme while recording another.	• Verify your model number. ➡ Only models KV-14V6D and KV-21V6D are able to play one programme while recording another.
Timer recording	Timer settings cannot be made.	• The clock has not been set. ➡ Set the current time and date. (page 16) • You made a mistake when setting the timer. ➡ Check the setting steps. (pages 28 and 29)
	The cassette is ejected when you press TIMER REC ON/OFF.	• The safety tab of the cassette has been removed. ➡ Cover the tab hole with adhesive tape, or use another cassette with a safety tab.
	The TIMER REC lamp does not light up even though you press TIMER REC ON/OFF.	• No cassette has been inserted. ➡ Insert a cassette with its safety tab. • The tape is at its end. ➡ Rewind the tape. • No setting is made for timer recording. ➡ Set the programme for timer recording. (pages 28 and 29)
	Timer recording was not made.	• You did not press TIMER REC ON/OFF. • There has been a power interruption lasting more than a week.
Others	A cassette cannot be inserted.	• Another cassette is already inserted. ➡ Press ⏏ to eject the cassette.
	The remote control does not work.	• The batteries are low. ➡ Replace the batteries. (page 4) • The batteries are installed incorrectly. ➡ Install the batteries with correct polarities. (page 4)

GB

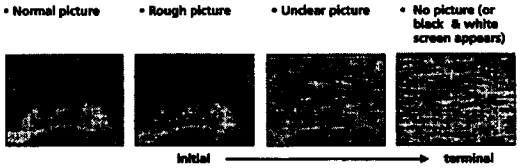
– 23 –

Taking Care of Your Video TV

Video head cleaning

When playback pictures are noisy and hardly visible, or when no picture appears, the video heads may be contaminated. In such a case, clean the video heads using the V-25CL video head cleaning tape (not supplied), or ask Sony service personnel to clean the video heads.

Symptoms caused by contaminated video heads



Worn video heads

If your video TV displays a poor picture after you clean the video heads, you may need to replace them. Consult your dealer or the Sony Service Center nearest you.

Check the video heads after 1,000 hours of use

A video TV is a high precision machine. It must record on or play from magnetic tapes on which the image signals from the colour TV or the video camcorder are recorded.
The video heads or mechanical parts for transporting the tape are contaminated or worn after extended use. You should have your video TV checked after each 1,000 hours of use.

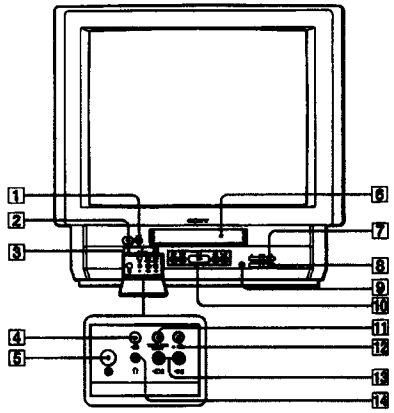
Note
Do not use a commercially available wet-type cleaning tape, as it may damage the video heads.

Index to Parts and Controls

Video TV set—front

This section briefly describes the buttons and controls on the video TV set and on the remote control. For more information, refer to the pages next to each description.

KV-21V5D, KV-21V6D



1 EJECT ⏏ button (page 22)

2 ⏻ (standby) button (page 17)

3 Lamps
⏻ (standby) (page 17)
TIMER REC (recording) (page 29)
REC (recording) (page 27)

4 -ᗡ (input select) button (pages 19, 42)

5 ⏼ (MAIN POWER) switch (pages 6, 17)

6 Cassette compartment (page 22)

7 PROGR (programme) +/– buttons (pages 17, 27)

8 ◿ (volume) +/– buttons (page 17)

9 Remote sensor

10 Tape transport buttons (page 23)

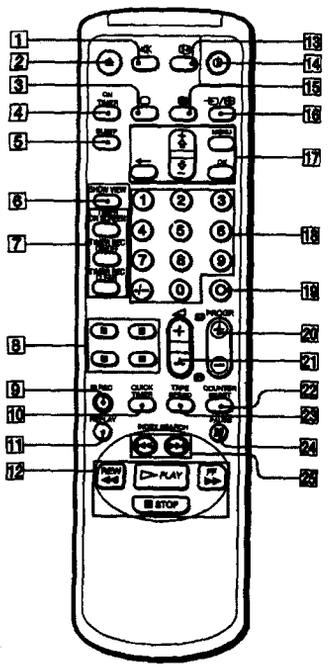
11 TIMER REC ON/OFF button (pages 29, 30)

12 REC (recording) ● button (page 27)

13 -ᗡ2/-Ɔ2 (video/audio input) jacks (page 42)

14 ∩ (headphones) jack (page 19)

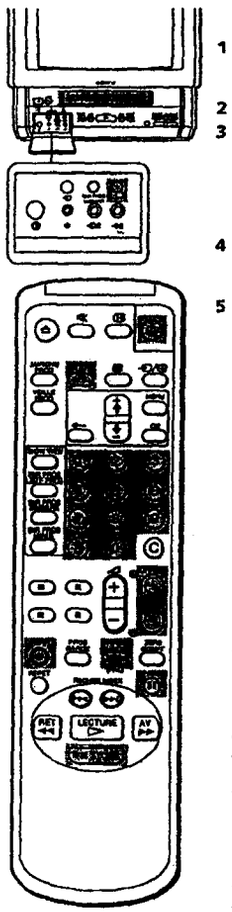
Remote control



1 🔇 (muting) button (page 19)
2 ⏏ (eject) button (page 22)
3 ⏻ (TV power on) button (pages 6, 17)
4 ON TIMER button (page 37)
5 SLEEP button (page 36)
6 SHOWVIEW button (page 34)
7 TIMER REC buttons
TIMER ON SCREEN (pages 28, 31)
ON/OFF (pages 29, 30)
CLEAR (pages 31, 34)
8 Teletext operation buttons (page 20)
9 REC ● (recording) button (page 27)
10 QUICK TIMER button (page 32)
11 REPLAY button (page 24)
12 Tape transport buttons (page 23)
PLAY ▷, STOP ■, REW (rewind) ◀◀, FF (fast forward) ▶▶
13 ⊞ (on-screen display) button (pages 19, 25)
14 ⏻ (standby) button (page 17)
15 ▣ (Teletext) button (page 20)
16 ⊡ (input select)/⊞ (hold) button (pages 19, 21, 42)
17 Menu operation buttons (pages 6, 7)
MENU
+ ⇧/– ⇩
⬅
OK
18 Number buttons (pages 17, 27, 34)
19 C (direct tuning) button (page 12)
20 PROGR (programme) +/–/▣/▣ (Teletext page access) buttons (pages 17, 21, 27)
21 🔊 (volume) +/– buttons (page 17)
22 COUNTER RESET button (page 23)
23 TAPE SPEED button (page 27)
24 PAUSE ❚❚ button (pages 23, 27)
25 INDEX SEARCH ⏮/⏭ buttons (page 39)

GB

Recording TV Programmes



Note (KV-21V6B)
In order to record a Pay-TV programme, you must set the desired Pay-TV channel as explained in "Setting a Pay-TV channel" (page 13).

Recording TV programmes

1 Press ⏻, CHAINE +/– or number buttons on the remote control, or CHAINE +/– on the video TV when the ⏻ lamp is lit in red (indicating that the video TV is in standby mode).
2 Insert a cassette with a safety tab.
3 Press VITES BANDE to select the recording speed, SP (Standard Play), or LP (Long Play). Recording in LP mode will extend the length of your tape.
Maximum recording time
SP mode: 4 hours with E-240
LP mode: 8 hours with E-240
(When recording in SECAM, use SP only.)
4 Select the programme position with CHAINE +/–. You can also use number buttons on the remote control. For double-digit numbers (e.g. 14), first press +/–, then press 1 and 4.
5 Press ENT ●.
The ENT lamp on the front of the video TV lights up and recording begins.

To stop recording

Press STOP ■.
When the tape reaches the end, the video TV rewinds the tape automatically to the beginning, then stops. This function does not work when the power of the video TV is off.

To pause recording

Press PAUSE ❚❚.
To resume recording, press PAUSE ❚❚ again.

You can cut out an unwanted scene during recording with this button.
1 Press PAUSE ❚❚ when an unwanted scene appears on the screen.
Recording pauses.
2 Press PAUSE ❚❚ again to release the pause mode at the desired scene.
Recording resumes from the point set in step 1.

When the recording pause mode lasts for about 5 minutes, the video TV stops recording.

Recording with the TV off

Press ⏻.
The TV screen is turned off and the ⏻ lamp lights up.
The video TV continues recording.

Watching a TV programme while recording another (KV-21V6B only)

You can watch a TV programme and record another at the same time if your video TV has two tuners. Only models KV-21V6B are equipped with two tuners.
Select the desired programme position with CHAINE +/– or the number buttons on the remote control or CHAINE +/– on the video TV.

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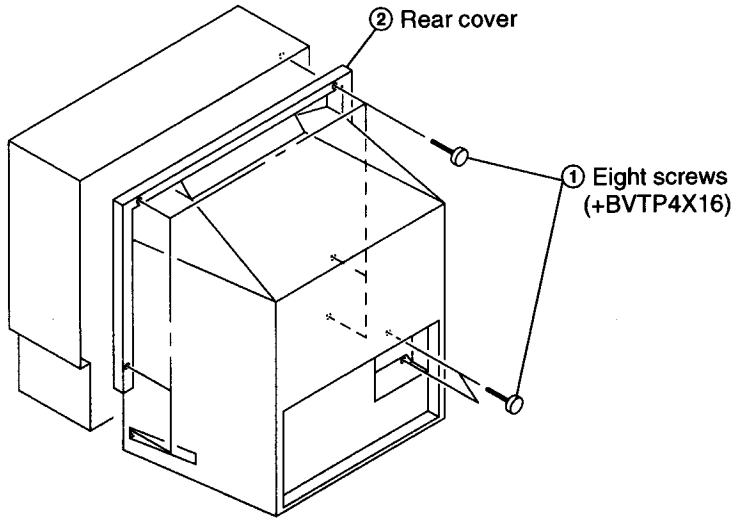
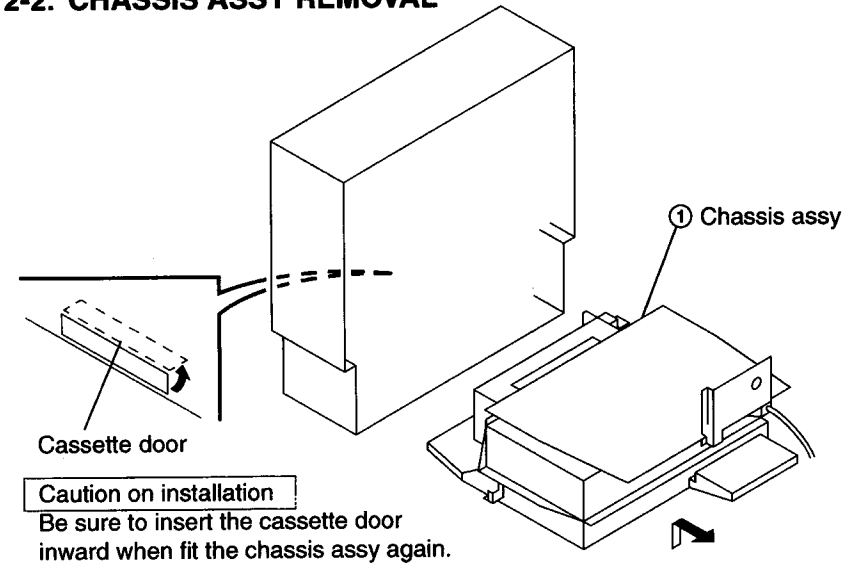
SECTION 2
DISASSEMBLY

2-1. REAR COVER REMOVAL

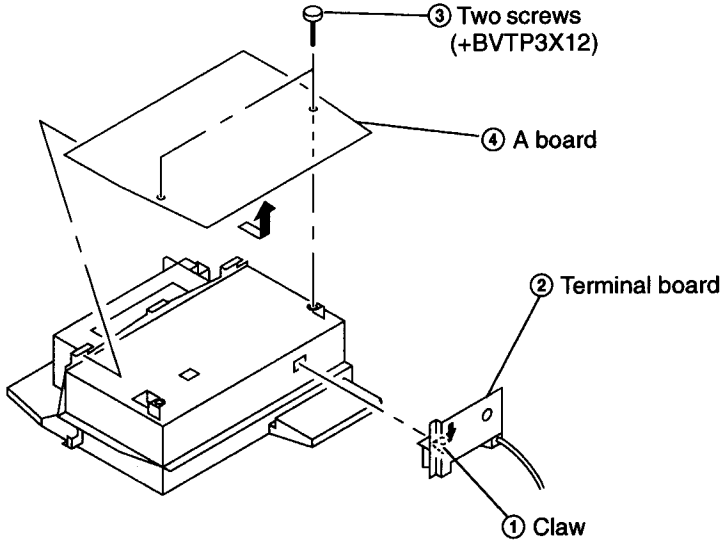


2-2. CHASSIS ASSY REMOVAL

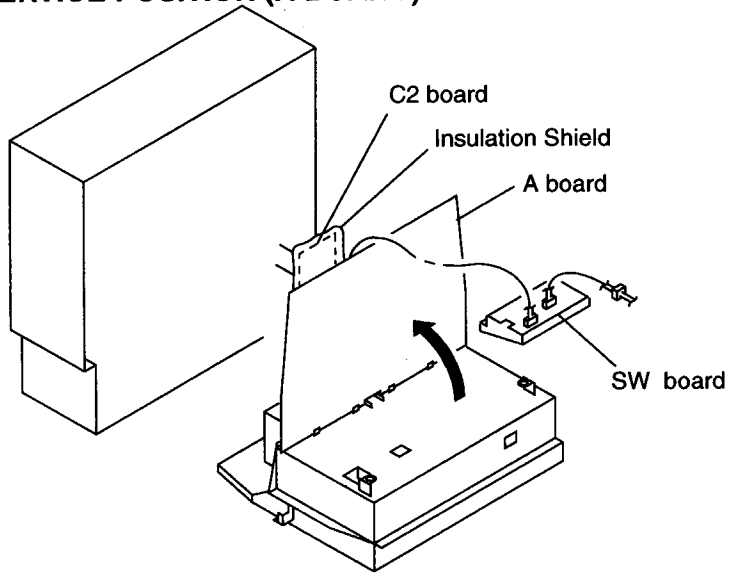


Caution on installation
Be sure to insert the cassette door inward when fit the chassis assy again.

2-3. A BOARD REMOVAL



2-4. SERVICE POSITION (A BOARD)

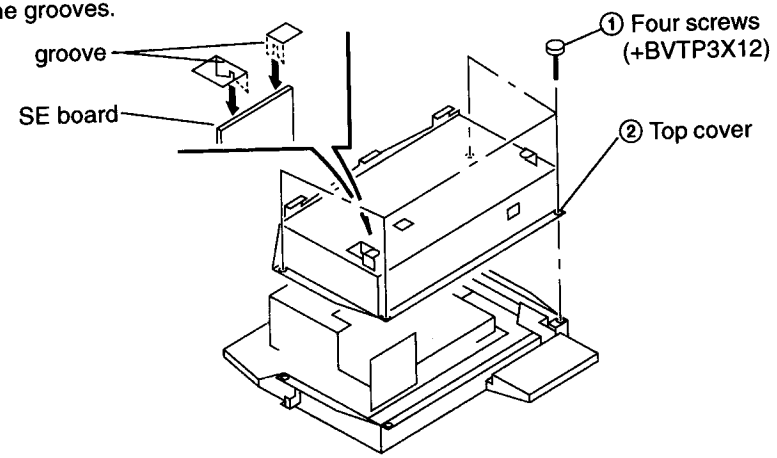


2-5. TOP COVER REMOVAL

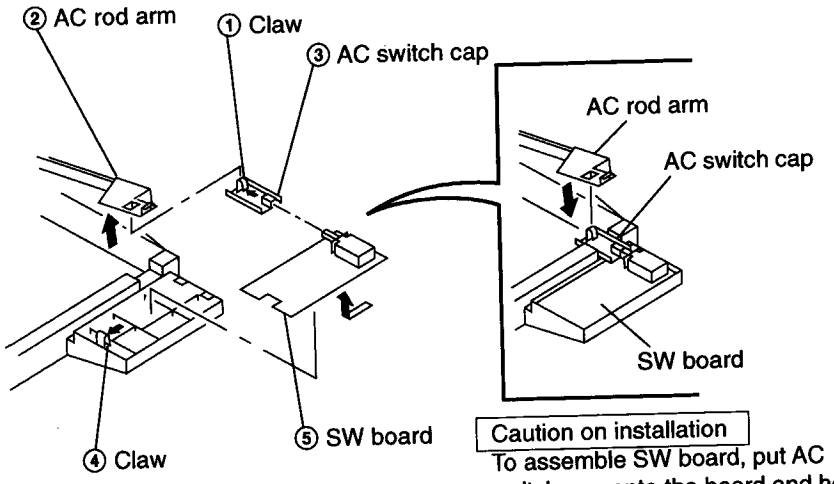
(21V5B/V6B)

Caution on installation

To put back Top cover, fit SE board in the grooves.



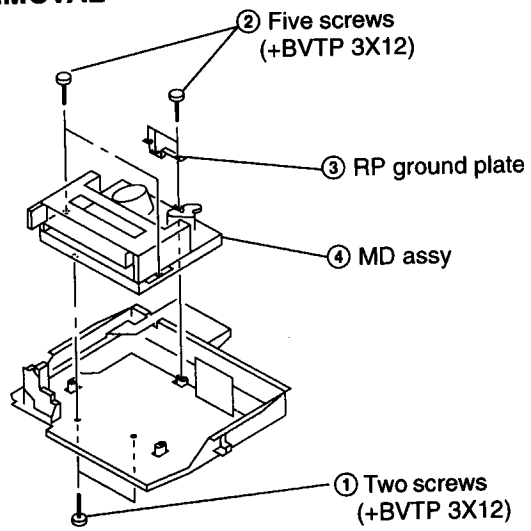
2-6. SW BOARD REMOVAL



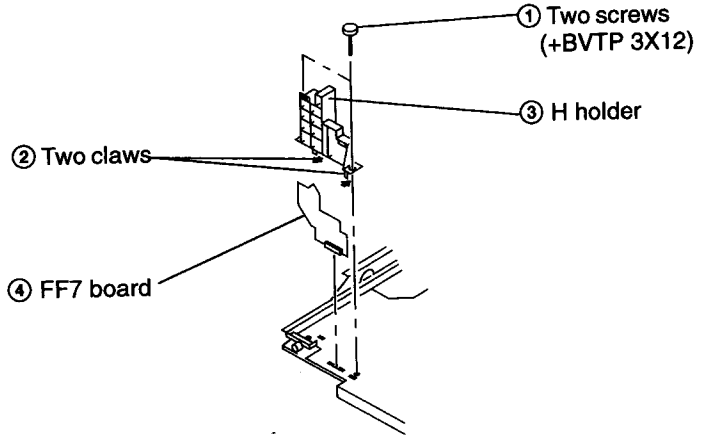
Caution on installation

To assemble SW board, put AC switch cap onto the board and hook up AC rod arm to the switch cap.

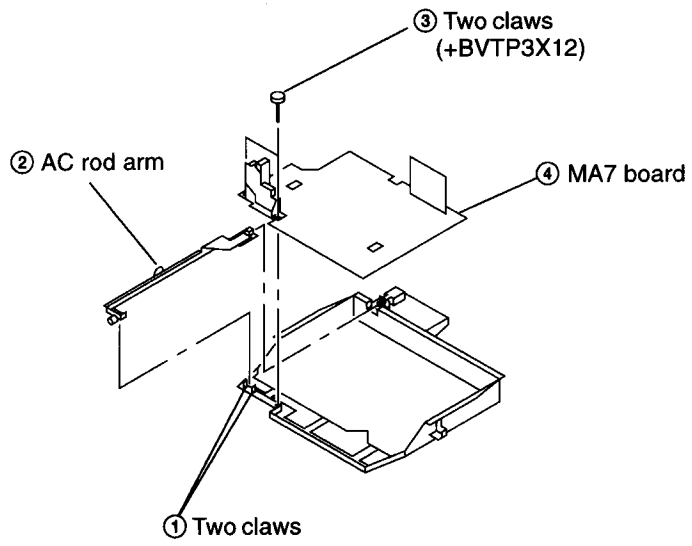
2-7. MD ASSY REMOVAL



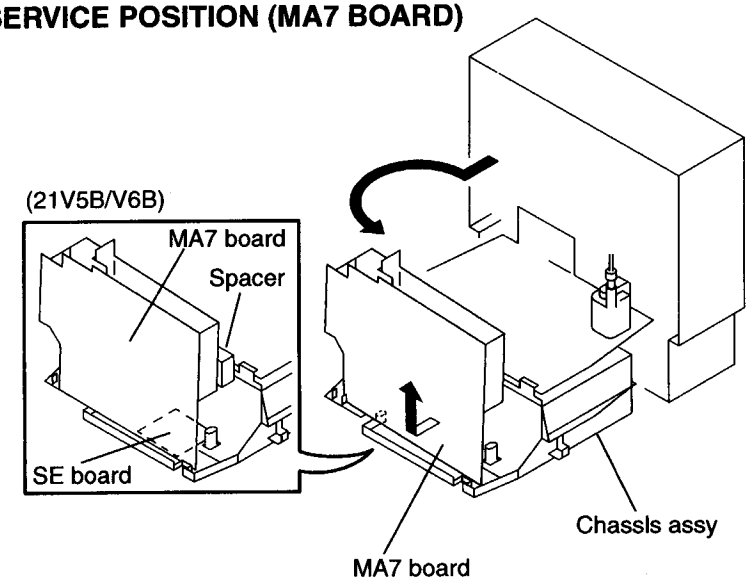
2-8. FF7 BOARD REMOVAL



2-9. MA7 BOARD REMOVAL



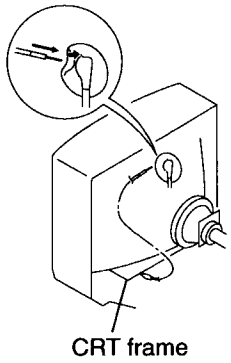
2-10. SERVICE POSITION (MA7 BOARD)

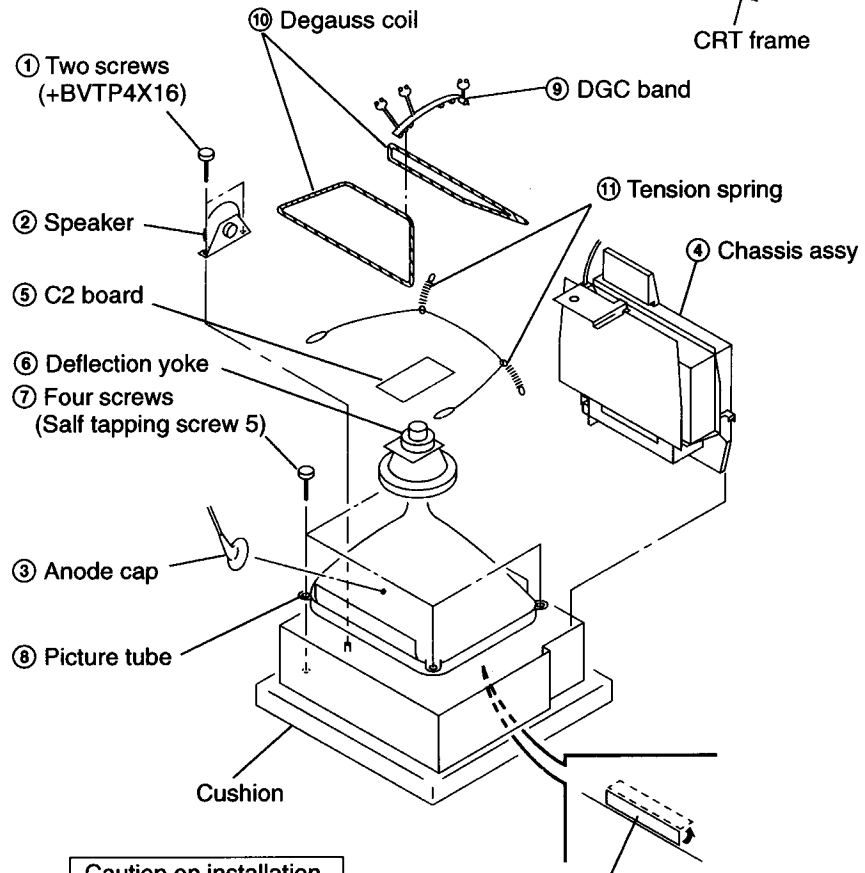


2-11. PICTURE TUBE REMOVAL

WARNING : Before removing anode cap
H. V. remains in the CRT even after the power is disconnected.

To avoid electrical shock, before attempting to remove the anode cap, discharge CRT : Short between anode and CRT frame.



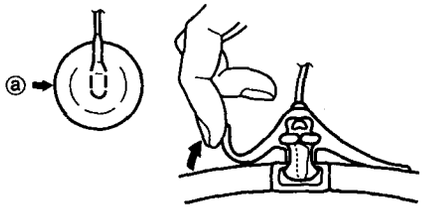


Caution on installation
Be sure to insert the cassette door inward when fit the chassis assy again.

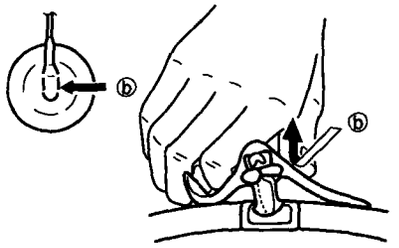
• REMOVAL OF ANODE-CAP

NOTE : Short circuit the anode of the picture tube and the anode cap to the metal chassis. CRT chield or carbon painted on the CRT, after removing the anode.

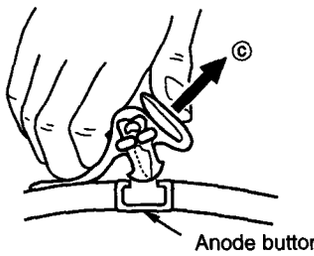
•REMOVING PROCEDURES



① Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ.



② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow ⓑ.



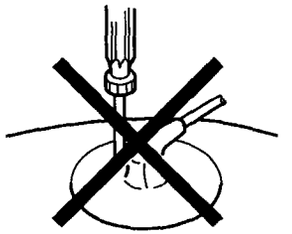
③ When one side of the rubber cap is separated from the anode button, the anode-cap can be romoved by turning up the rubber cap and pulling up it in the direction of the arrow ⓒ.

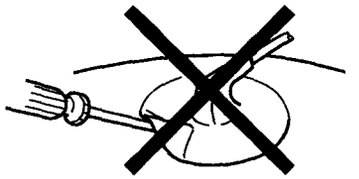
•HOW TO HANDLE AN ANODE-CAP

① Don't hurt the surface of anode-caps with sharp shaped material!

② Don't press the rubber hardly not to hurt inside of anode-caps! A material fitting called as shatter-hook terminal is built in the rubber.

③ Don't turn the foot of rubber over hardly! The shatter-hook terminal will stick out or hurt the rubber.





SECTION 3
SELF DIAGNOSIS FUNCTION

When turning on the TV, a self diagnosis function is executed.
If no acknowledgment is returned from a device which is turned "ON", the device has a problem.
In this case, one of the LED's responding to the problem device will flicker a defined number of times.

The flickering frequency responding to each failed device is shown below.

Board	A board	A board	A board
Ref. No.	Q802, T801	IC304, IC501	D807
Device	H. OUT, FBT	YCJ, V-OUT	200V RECT, C board
Flickering Frequency	2	4	5

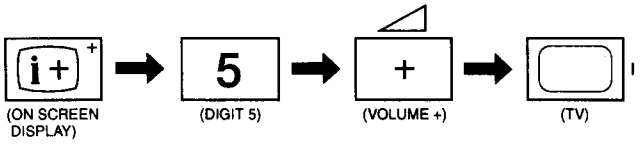
All the devices are checked one after another from the left of the table.
So, if more than 1 device has failed, only the one the left side will flicker.

1. Self Diagnosis Screen Display

On-screen display information shows if there occurred any intermittent Failures before, such as "intermittent no picture", etc. that serviceman cannot confirm the symptom (if the failure detection circuit has operated before).

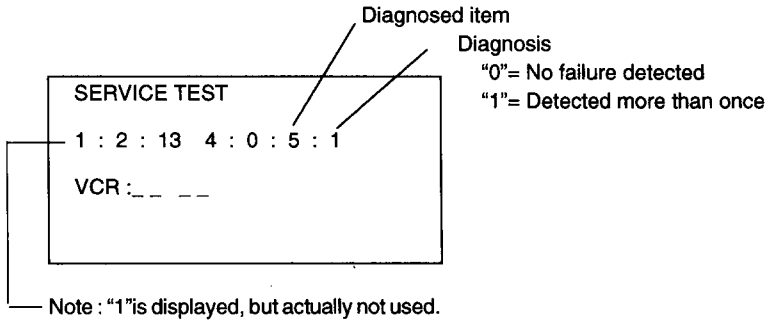
<How to Display>

When STAND BY condition, press the remote commander buttons quickly in the sequence below.



*Be careful, it's different from the way to enter in service mode ("VOLUME +") !!

Self Diagnosis Screen


Diagnosed item
Diagnosis
"0"= No failure detected
"1"= Detected more than once
SERVICE TEST
1 : 2 : 13 4 : 0 : 5 : 1
VCR :_ _ _ _
Note : "1"is displayed, but actually not used.

2. Clearance of Self Diagnosis Screen

The Diagnosis (result) is not automatically cleared. After checking the screen be sure to clear it by resetting the diagnosis result to "0".

Otherwise the self diagnosis system will not operate properly in case of newly occurred failures.

<How to Clear>

To clear the diagnosed result, press the remote commander buttons in the sequence below while the diagnosis screen is displayed.

Don't enter in the service mode and do it. If you do it, you will rewrite all the other electric adjustment data !

CHANNEL [8] ➡ [0]

<How to Exit from the Screen>

To exit from the self diagnosis screen, power off by pressing the power button on the remote commander or the TV main unit.

SECTION 4
SET-UP ADJUSTMENTS

- The following adjustments should be made when a complete realignment is required or a new picture tube is installed.
- These adjustments should be performed with the rated power supply voltage, unless otherwise noted.

The Contrast and Brightness controls should be set as follows unless otherwise noted:

CONTRAST control 80%
(or Normal by commander)
BRIGHTNESS control 50%

Perform the adjustments in the following order:
1. Beam Landing
2. Convergence
3. Screen (G2), Drive, White Balance and Sub Bright.
4. Focus

Note: Test Equipment Required.
1. Coluor bar/Pattern Generator
2. Degausser
3. DC Power Supply
4. Digital multimeter
5. Oscilloscope

Preparation:
- In order to reduce the influence of external magnetic forces on the picture tube, face the TV set in an easterly or westerly direction.
- Turn the power switch for the unit ON and erase the magnetic force using a degausser.

4-1. BEAM LANDING

Demagnetize with a degausser.
1. Input an all white raster signal from the pattern generator.
   CONTRAST } normal
   BRIGHTNESS }
2. Switch the raster signal of the pattern generator to Red.
3. Move the deflection yoke backward, and adjust with the purity control so that Red is at the center and the Blue and Green are evenly spaced at the sides. see (Fig. 4-1 – 4-3)
4. Move the deflection yoke forward, and adjust so that the entire screen becomes Red. (Fig. 4-1)
5. Switch the raster signal to Blue and then Green to confirm the condition.
6. When the position of the deflection yoke has been determined, tighten it with the deflection yoke mounting screw.
7. When the landing at the corners is not correct, adjust by using disk magnets. (Fig. 4-4)

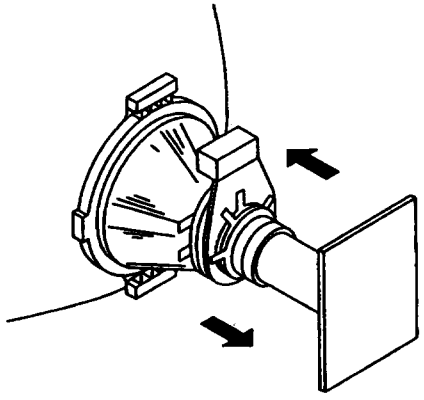


Fig. 4-1

Fig. 4-2

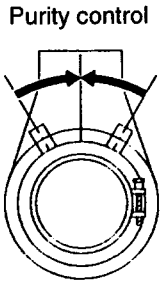


Fig. 4-3

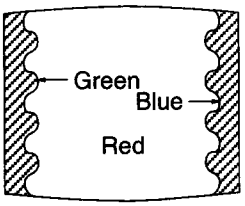
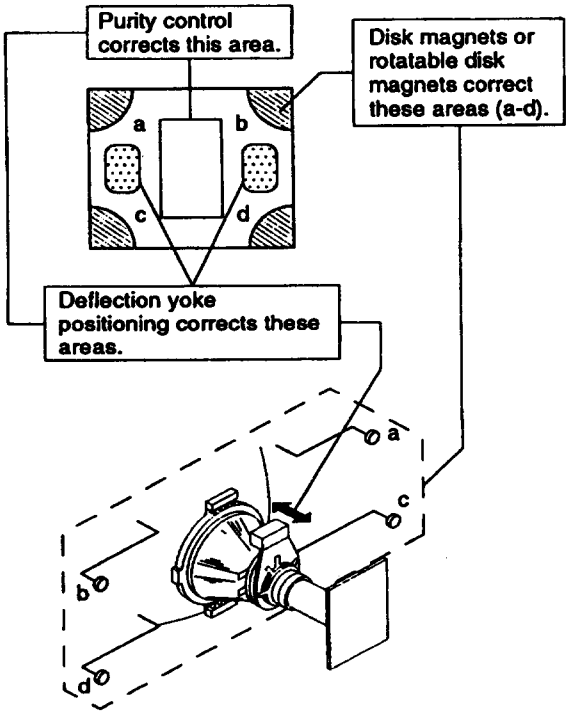


Fig. 4-4

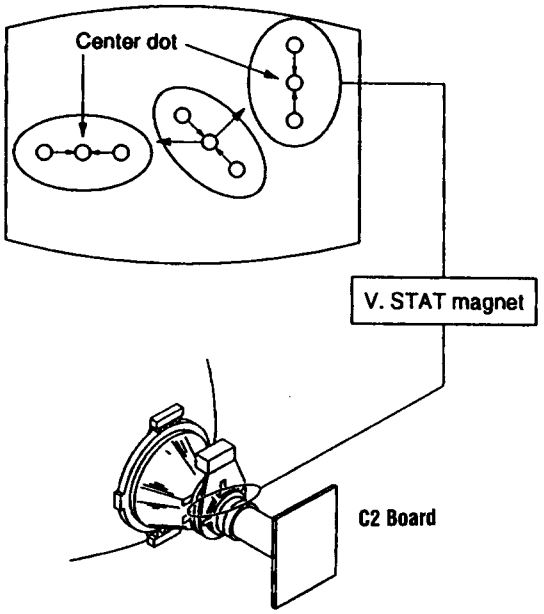


4-2. CONVERGENCE

Preparation:

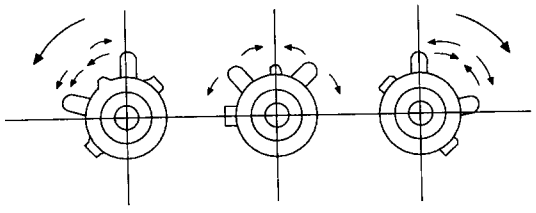
- Before starting, perform FOCUS, H.SIZE, and V.SIZE adjustments.
- Set the BRIGHTNESS control to minimum.
- Input a dot pattern from the pattern generator.

(1) Horizontal and Vertical Static Convergence Adjustment

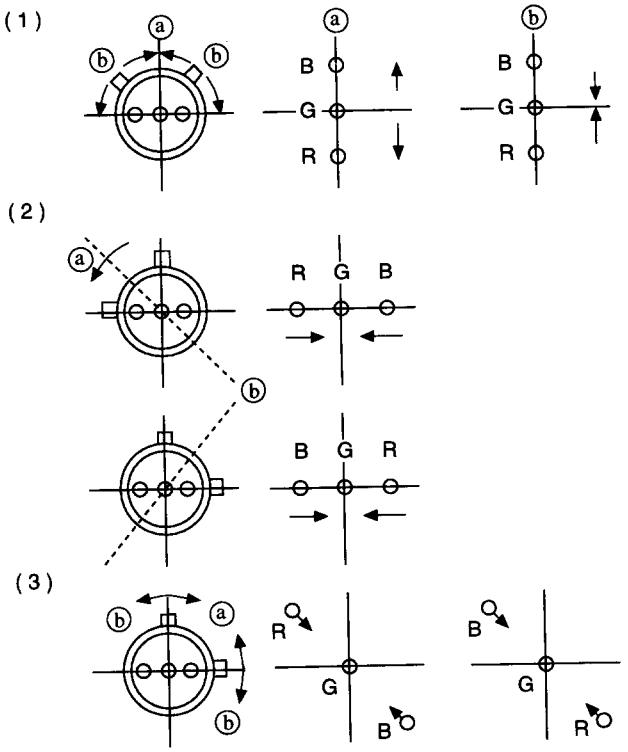


1. Adjust the V.STAT magnet to converge the Red, Green and Blue dots at the center of the screen. (Vertical and Horizontal movement)

- Tilt the V.STAT magnet and adjust the static convergence by opening or closing the V.STAT magnet.



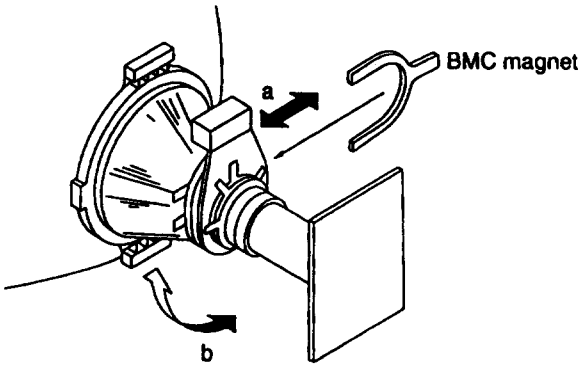
2. When the V.STAT magnet is moved in the direction of the (a) and (b) arrows, the Red, Green and Blue dots move as shown below.



If the Red and Blue dots do not converge with the Green dots, perform the following steps.

1. Move the BMC magnet (a) to correct for insufficient H.static convergence.
2. Rotate the BMC magnet (b) to correct for insufficient V.static convergence.

In either case, repeat the Beam Landing Adjustment.

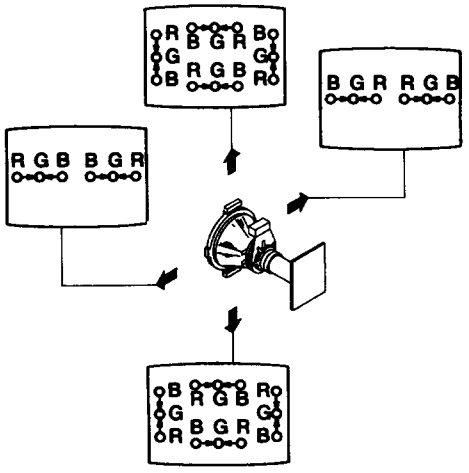


(2) Dynamic Convergence Adjustment

Preparation:

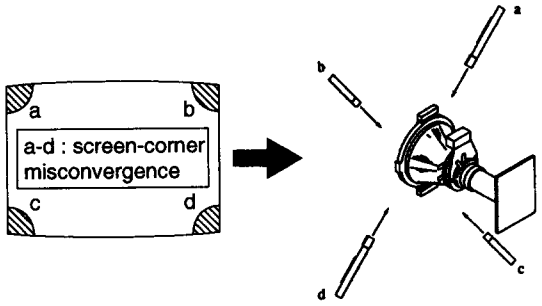
- Before starting to perform the Horizontal and Vertical static convergence adjustment.

1. Slightly loosen the deflection yoke screw.
2. Remove the deflection yoke spacers.
3. Move the deflection yoke for best convergence as shown below.
4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.



(3) Screen-corner Convergence Adjustment

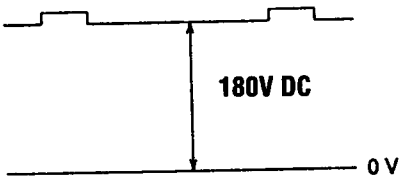
Affix a Permalloy ass'y corresponding to the misconverged areas



4-3. SCREEN (G2), WHITE BALANCE, and SUB BRIGHT

(1) Screen (G2) Adjustment

1. Set the PICTURE and BRIGHT (FBT) to normal.
2. Put to VIDEO input mode without signals.
3. Connect R, G, and B of the C board cathode to the ocsilloscope.
4. Adjust G2 (FBT) volume to the value below.

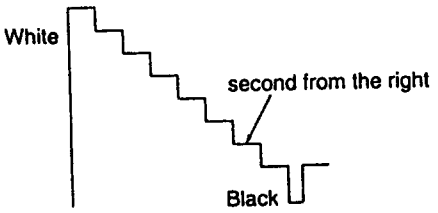


(2) White Balance Adjustment

1. Set to Service Mode.
2. Input white raster signal.
3. Set the PICTURE to minimum.
4. Select SBRT (14) with [1] and [4], and then set the level to minimum with [3] and [6].
5. Select GCUT (17) and BCUT (18) with [1] and [4], and adjust the level with [3] and [6] for the best white balance.
6. Set the PICTURE to maximum.
7. Select GDRV (15) and BDRV (16) with [1] and [4], and adjust the level with [3] and [6] for the best withe balance.
8. Write into the memory by pressing [MUTING] then [0].

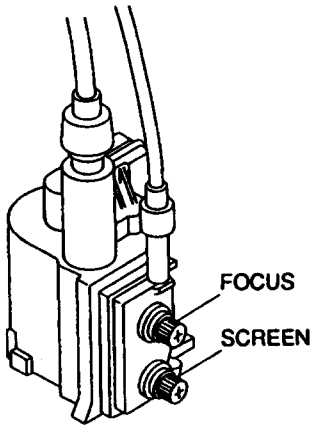
(3) Sub Bright Adjustment

1. Set to service mode.
2. Input a staircase signal of black to white from the pattern generator.
3. BRIGHT.....50%.
   PICTURE.....minimum
4. Select SBRT (14) with [1] and [4], and adjust SBRT level with [3] and [6] so that the second stripe from the right is dimly lit.



4-4. FOCUS

Adjust the FOCUS control FBT so that the whole screen is in best focus.

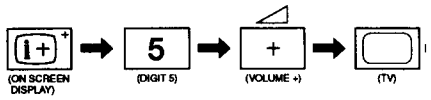


SECTION 5
CIRCUIT ADJUSTMENTS

Service adjustment to this model can be performed with the supplied Remote Control Commander RM-C810, RM-C811, RM-C812 and RM-C813.

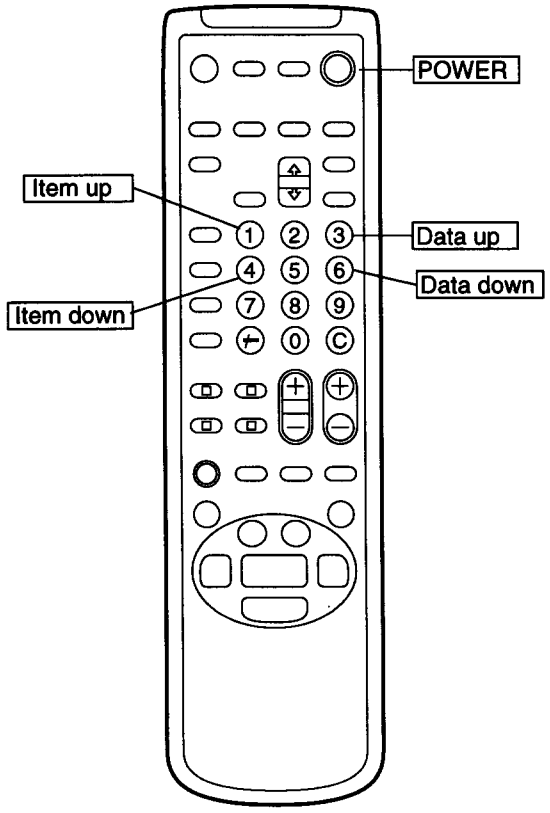
5-1. HOW TO ENTER INTO SERVICE MODE

1. Turn on the main power of the set and enter into stand-by mode.
2. Press the following sequence of buttons on the Remote Control Commander.



"Service mode" will appear in the top right corner of the screen Other status information will also be displayed.

3. Press the "1" or "4" buttons to select the adjustment item from the table.
4. Press the "3" or "6" buttons to change the data as required.
5. Turn off the power to quit the service mode when adjustments are completed.



RM-C810

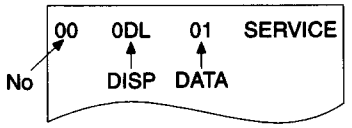
1, 4	Slect the adjustment item.
↓ 3, 6	Raise/lower the data value.
↓ MUTING	Weites.
↓ 0	Executes the writing.

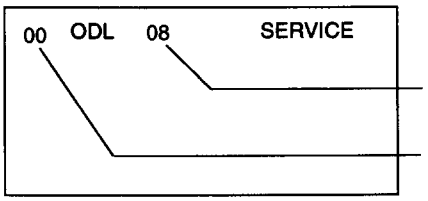
7, 0 All service data becomes the values in memory.

8, 0 All used control goes to the standard state.

5, 0 Service data initialzation (Be sure not to use usually.)

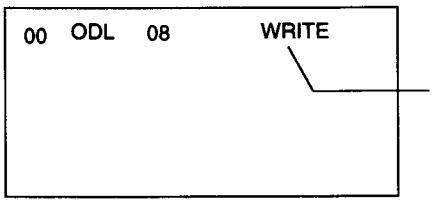
2, 0 Write 50Hz adjustment data to 60Hz, or vice versa.



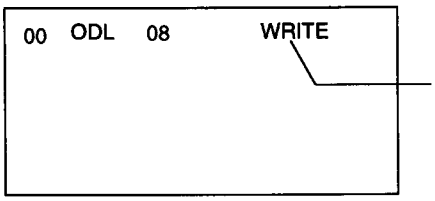


Data adjusted with 3 and 6 buttons.

Item selected with 1 and 4 buttons.



The display changes from SERVICE to WRITE. (Red)



The WRITE display thenchanges back to SERVICE.

Range of adjustments available from the on screen menu system.

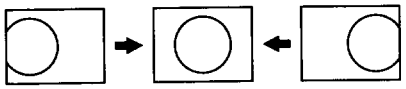
No.	DISP	DATA RANGE	STANDARD DATA	Item	Device
00	ODL	00-FF	8	ON Delay timer	CXP85460-063Q-TL (μ-COM)
01	OSH	00-3F	5	OSD Horizintal Position	
02	MUT	00-01	1	Auto Muting of No Sync	
03	32AJ	00-01	OFF	32KHz Adjust Test Mode	S3510A(Clock)
04	SCON	00-0F	9	Sub CONTRAST	CXA2076Q-TL (Y/C/J)
05	TRAP	00-0F	7	Chroma Trap fO	
06	SSHP	00-0F	7	Sub SHARPNESS	
07	POVR	00-03	3	Pre/Over-Shoot ratio Switching	
08	DL	00-07	5	Y Delay Control	
09	DTRA	00-01	1	DC-TRAN	
10	DPIC	00-01	1	D PIC	
11	TOT	00-01	1	TOT	
12	SSAT	00-4F	9	Sub COLOR	
13	SHUE	00-4F	7	Sub HUE	
14	SBRT	00-4F	1A	Sub BRIGHT	
15	GDRV	00-3F	1D	G Drive	
16	BDRV	00-3F	16	B Drive	
17	GCUT	00-0F	4	G Cutoff	
18	BCUT	00-0F	4	B Cutoff	
19	DCOL	00-01	0	Dynamic Color Switch	
20	GAMM	00-03	1	Gamma Correction	
21	REFP	00-03	2	Reference Pulse Timing Control	
22	RON	00-01	1	R ON	
23	GON	00-01	1	G ON	
24	BON	00-01	1	B ON	
25	YS1	00-01	1	YS1 OFF	
26	AFC	00-03	1	AFC loop gain switching (TV)	
27	PAFC	00-03	1	AFC loop gain switching (PB)	
28	VBLK	00-03	3	VBLK Width Control	
29	HPOS	00-0F	7	Horizontal Position	
30	VPOS	00-3F	IF	V Position	
31	VSIZ	00-3F	27	V Size	
32	VLIN	00-0F	6	V Linearily	
33	SCOR	00-0F	2	S Correction	
34	AFCB	00-0F	7	AFC BOW	
35	AFCA	00-0F	7	AFC ANGLE	
36	PCMP	00-3F	15	PIN COMP	
37	HSIZ	00-3F	25	H Size	
38	EHTH	00-03	3	EHT-H	
39	EHTV	00-03	3	EHT-V	
40	PPHS	00-0F	5	PIN PHASE	
41	UCNP	00-0F	6	UP Corner-Pin	
42	LCNP	00-0F	7	LO Corner-Pin	
43	VASP	00-3F	2F	V Aspect	
44	ZOOM	00-01	0	Zoom mode	
45	VSCR	00-3F	1F	V Scroll	
46	JUMP	00-01	0	Jump Switch	
47	ULIN	00-0F	0	Upper V Linearity	
48	LLIN	00-0F	0	Lower V Linearity	
49	LBLK	00-0F	7	Left H Blanking	
50	RBLK	00-0F	7	Right H Blanking	
51	SCPR	00-03	1	SCP BGR	
52	SCPF	00-03	1	SCP BGF	
53	KLOF	00-01	0	KIL-OFF	
54	CTYP	00-01	1	CRT-TYPE	
55	ID0	00-01	0	Model ID0 (NO USE)	CXP85460-063Q-TL (μ-COM)
56	ID1	00-01	0	Model ID1 (NO USE)	
57	ID2	00-01	0	Model ID2 (NO USE)	
58	ID3	00-01	0	Model ID3 (NO USE)	

5-2. DEFLECTION SYSTEM ADJUSTMENT

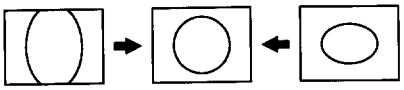
1. Enter into the service mode.
2. Using the "1" or "4" buttons select the Adjust item.
3. Press the "3" or "6" button to enter the adjustment submenu.
4. Select and adjust each item in order to obtain the optimum image.

No.	DISP	DATA	Range
29	HPOS	7	00 - 0F
31	VSIZ	27	00 - 3F
32	VLIN	6	00 - 0F
33	SCOR	2	00 -0F
34	AFCB	7	00 -0F
35	AFCA	7	00 -0F
36	PCMP	15	00 -3F
37	HSIZ	25	00 - 3F
40	PPHS	5	00 - 0F
41	UCNP	6	00 - 0F
42	LCNP	7	00 - 0F

29 HPOS (H POSTION)



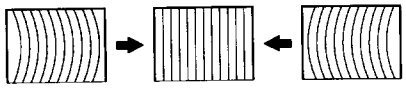
31 VSIZ (V SIZE)



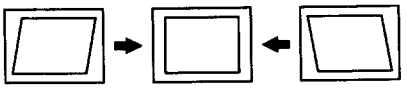
32 VLIN (V LINEARITY)

33 SCOR (VS-CORRECTIONIZE)

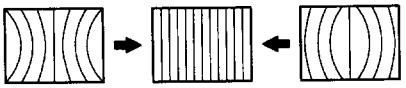
34 AFCB (AFC BOW)



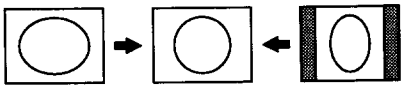
35 AFCA (AFC ANGLE)



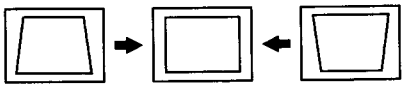
36 PCMP (PIN CORRECTION)



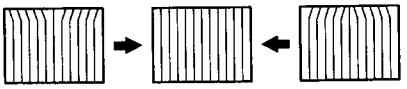
37 HSIZ (H SIZE)



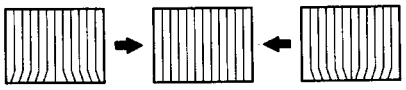
40 PPHS (PIN PHASE)



41 UCNP (UPPER CORNER PIN)



42 LCNP (LOWER CORNER PIN)



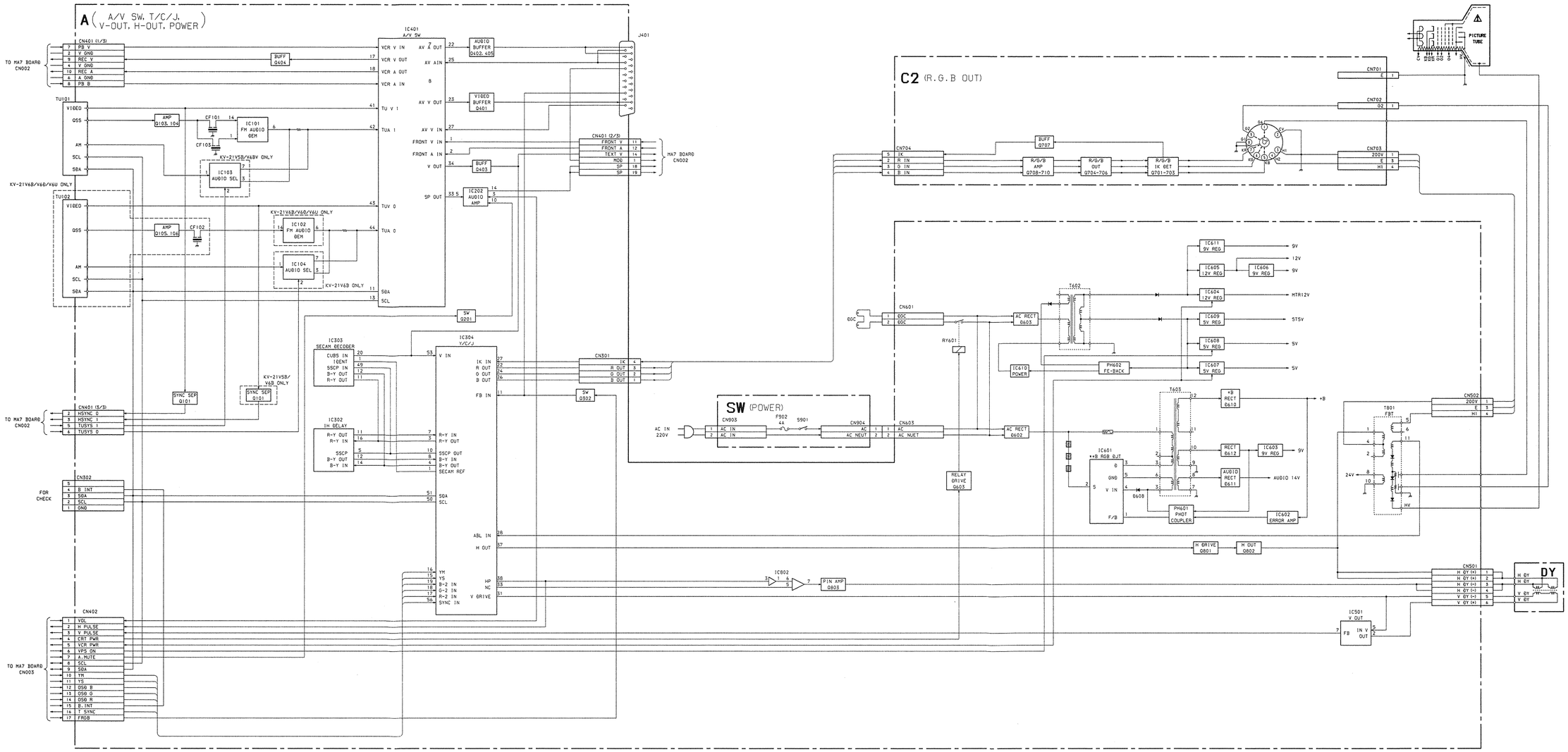
5-3. A BOARD ADJUSTMENT AFTER IC002 (MEMORY) REPLACEMENT

1. Enter to Service Mode.
2. Press commander buttons [5] and [0] (Data Initialize), and [2] and [0] (Data Copy) to initialize the data.
3. Call each item number and check if the respective screen shows the normal picture.
   In cases where items are not well adjusted, rectify the items with fine adjustment.
   Write the data per each item number ([MUTING] + [0]).
4. Press commander buttons [8] and [0] (Test Normal) to return the user controls to the setting that was set on shipment from the factory (This will also cancel Service Mode).

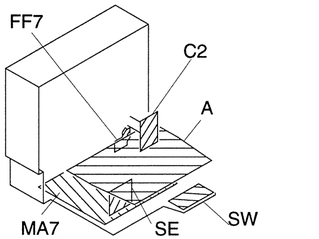
TV SECTION

SECTION 6
DIAGRAMS

6-1. BLOCK DIAGRAM



6-2. CIRCUIT BOARDS LOCATION



6-3. PRINTED WRING BOARDS AND SCHEMATIC DIAGRAMS

Note:

- Capacitors are with out voltage indication are all 50V.
- All electrolytics are in 50V unless otherwise specified.
- All resistors are in ohms.
  kΩ=1000Ω, MΩ=1000kΩ
- Indication of resistance, which dose not have one for rating electrical power, is as follows.

  Pitch : 5mm
  Rating electrical power : 1/4 W
- : nonflammable resistor.
- : fusible resistor.
- △ : internal component.
- : panel designation and adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- As to the voltage volue shown by the semiconductors on the Shematic Diagram, see the another list
- Readings are taken with a color-bar signal input.
- Readings are taken with a 10MΩ digital multimeter.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
  * : Measurement impossibillity.
- : B+line.
- : B-line.
  (Actual measured value may be different).
- : signal path. (RF)
- Circled numbers are waveform references.

Reference information

RESISTOR : RN METAL FILM
: RC SOLID
: FPRD NONFLAMMABLE CARBON
: FUSE NONFLAMMABLE FUSIBLE
: RW NONFLAMMABLE WIREWOUND
: RS NONFLAMMABLE METAL OXIDE
: RB NONFLAMMABLE CEMENT
: ※ ADJUSTMENT RESISTOR

COIL : LF-8L MICRO INDUCTOR
CAPACITOR : TA TANTALUM
: PS STYROL
: PP POLYPROPYLENE
: PT MYLAR
: MPS METALIZED POLYESTER
: MPP METALIZED POLYPROPYLENE
: ALB BIPOLAR
: ALT HIGH TEMPERATURE
: ALR HIGH RIPPLE

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés per un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Terminal name of semiconductors in silk screen printed circuit (*)

	Device	Printed symbol	Terminal name	Circuit
①	Transistor	T	Collector / Base T Emitter	
②	Transistor	—	Collector / Base Emitter	
③	Diode		Cathode — Anode	
④	Diode	T	Cathode / Anode T (NC)	
⑤	Diode	—	Cathode / Anode (NC)	
⑥	Diode	T	Common / Anode T Cathode	
⑦	Diode	—	Common / Anode Cathode	
⑧	Diode	T	Common / Anode T Anode	
⑨	Diode	—	Common / Anode Anode	
⑩	Diode	T	Common / Cathode T Cathode	
⑪	Diode	—	Common / Cathode Cathode	
⑫	Transistor (FET)		Drain Source Gate	
⑬	Transistor (FET)		Drain Source Gate	
⑭	Transistor (FET)		Source Drain Gate	
⑮	Transistor		Emitter Collector Base	
–	Discrete semiconductot			

(Chip semiconductors that are not actually used are included.)

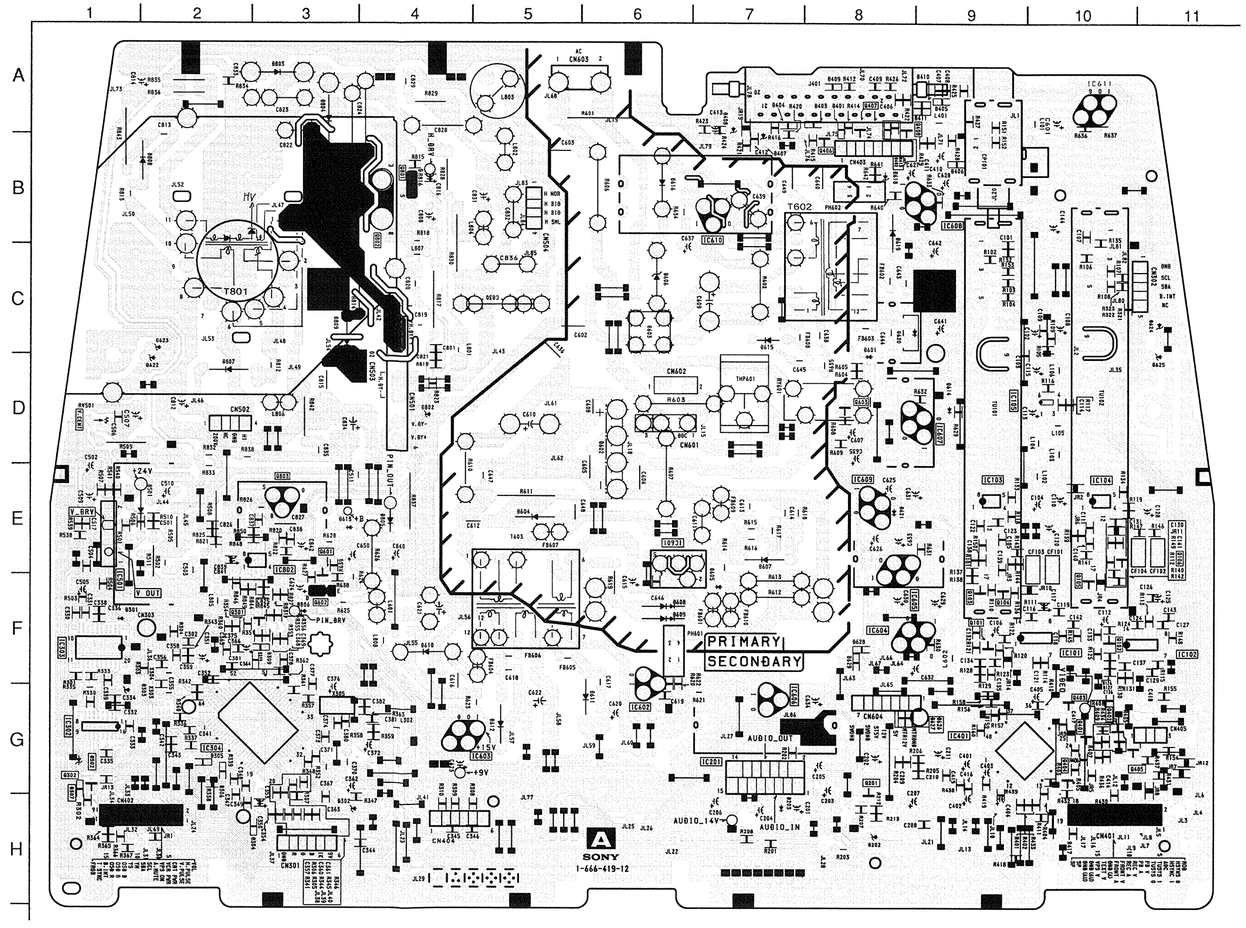
Ver.1.4

A [POWER, Y/C/J, TUNER, A/V SW, H-OUT, V-OUT]

A BOARD

DIODE		*	D806	F-3	–
D202	H-8	–	D807	D-2	–
D203	H-7	–	D808	B-2	–
D301	F-1	–	D809	C-3	–
D302	H-3	–	IC		
D303	G-1	–	IC101	F-10	
D304	H-3	⑤	IC102	F-11	
D305	G-2	⑤	IC103	E-9	
D306	G-2	⑤	IC104	E-10	
D307	G-1	–	IC105	D-10	
D308	F-3	⑤	IC201	G-7	
D309	F-3	⑤	IC302	G-1	
D401	A-8	⑤	IC303	F-1	
D402	A-8	⑤	IC304	G-3	
D403	A-8	⑤	IC401	G-10	
D404	A-7	⑤	IC501	E-1	
D405	A-9	⑤	IC601	E-6	
D406	B-9	⑤	IC602	F-6	
D407	B-7	–	IC603	G-4	
D408	A-7	–	IC604	F-9	
D409	A-8	⑤	IC605	E-8	
D410	A-9	⑤	IC606	G-7	
D411	A-9	⑤	IC607	D-9	
D501	E-2	–	IC608	B-9	
D502	G-1	–	IC609	E-8	
D601	D-8	–	IC610	B-7	
D602	D-6	–	IC611	A-10	
D603	C-6	–	IC802	E-3	
D604	E-5	–	VARIABLE RESISTOR		
D605	F-7	–	RV501	D-1	
D606	C-6	–	TRANSISTOR	*	
D607	E-7	–	Q101	F-9	①
D608	F-6	–	Q102	F-10	①
D609	F-6	–	Q103	F-9	①
D610	F-4	–	Q104	F-9	①
D611	G-6	–	Q105	F-10	①
D612	G-5	–	Q106	E-10	①
D613	E-3	–	Q201	G-8	①
D614	D-9	–	Q301	F-3	①
D615	C-7	–	Q302	G-1	①
D616	B-6	–	Q401	G-10	①
D618	B-8	–	Q402	G-10	①
D619	B-8	–	Q403	G-10	①
D620	C-9	–	Q404	G-10	①
D621	E-8	–	Q405	G-10	①
D622	D-2	–	Q406	B-8	①
D623	C-2	–	Q407	A-8	①
D626	G-8	⑤	Q408	A-8	①
D627	G-8	⑤	Q501	E-3	–
D628	F-8	⑤	Q602	F-3	–
D629	F-8	⑤	Q603	D-8	①
D802	D-4	–	Q801	B-4	–
D803	A-3	–	Q802	B-4	–
D804	A-3	–	Q803	E-3	–
D805	E-4	–			

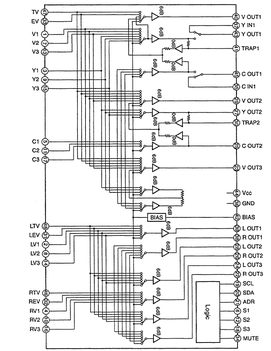
– A BOARD –



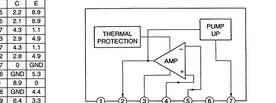
• A BOARD WAVEFORMS

① PAL/SECAM 0.9Vp-p (H)	① NTSC 1.0Vp-p (H)	② PAL/SECAM 1.0Vp-p (H)	② NTSC 1.0Vp-p (H)	③ PAL/SECAM 1.0Vp-p (H)	③ NTSC 2.1Vp-p (H)
④ PAL/SECAM 0.9Vp-p (H)	④ NTSC 1.0Vp-p (H)	⑤ PAL/SECAM 2.3Vp-p (H)	⑤ NTSC 2.4Vp-p (H)	⑥ PAL/SECAM 2.3Vp-p (H)	⑥ NTSC 2.4Vp-p (H)
⑦ PAL/SECAM 2.3Vp-p (H)	⑦ NTSC 2.3Vp-p (H)	⑧ PAL/SECAM 2.0Vp-p (H)	⑧ NTSC 1.6Vp-p (H)	⑨ 46.0Vp-p (V)	⑩ 0.4Vp-p (V)
⑪ 9.0Vp-p (H)	⑫ 64.4Vp-p (H)	⑬ 13.Vp-p (H)	⑭ 920.0Vp-p (H)	⑮ 92.0Vp-p (H)	⑯ 58.0Vp-p (H)
⑰ 8.7Vp-p (V)	⑱ 47.5Vp-p (V)				

A BOARD : IC401 CXA1855Q



A BOARD : IC501 LA7840L



A BOARD ※ MARK LIST

	KV-21VSA21/SD21/V5E	KV-21V5B	KV-21V5K	KV-21V5U	KV-21VGA21/VSD21/V8E	KV-21V6B	KV-21V6U
C1007	–	–	–	–	0.01 B CHIP	0.01 B CHIP	0.01 B CHIP
C1008	–	–	–	–	10	10	10
C1009	–	–	–	–	0.01 B CHIP	0.01 B CHIP	0.01 B CHIP
C1010	–	–	–	–	47 25V	47 25V	47 25V
C1011	–	–	–	–	0.1 25V B CHIP	0.1 25V B CHIP	0.1 25V B CHIP
C1012	–	–	–	–	47 25V	47 25V	47 25V
C1013	–	1 16V F CHIP	1 16V F CHIP	–	–	1 16V F CHIP	–
C1023	–	1 16V F CHIP	1 16V F CHIP	–	–	1 16V F CHIP	–
C1024	–	–	–	–	0.1 25V B CHIP	0.1 25V B CHIP	0.1 25V B CHIP
C1025	–	–	–	–	–	–	–
C1026	–	–	–	–	2.2 16V F CHIP	2.2 16V F CHIP	2.2 16V F CHIP
C1027	–	–	–	–	2.2 16V F CHIP	2.2 16V F CHIP	2.2 16V F CHIP
C1028	–	–	–	–	47 25V	47 25V	47 25V
C1029	–	–	–	–	0.01 B CHIP	0.01 B CHIP	0.01 B CHIP
C1030	–	–	–	–	1 16V F CHIP	–	–
C1031	–	–	–	–	1 16V F CHIP	–	–
C1033	–	–	–	–	0.1 25V B CHIP	0.1 25V B CHIP	0.1 25V B CHIP
C1036	–	–	–	–	0.047 25V B CHIP	0.047 25V B CHIP	0.047 25V B CHIP
C1037	–	–	–	–	270p CH CHIP	270p CH CHIP	270p CH CHIP
C1039	–	–	–	–	100p CH CHIP	100p CH CHIP	100p CH CHIP
C1041	–	–	–	–	0.0047 B CHIP	0.0047 B CHIP	0.0047 B CHIP
C1042	–	–	0.01 B CHIP	–	–	–	–
C600	2.2 16V F CHIP	2.2 16V F CHIP	–	2.2 16V F CHIP	2.2 16V F CHIP	2.2 16V F CHIP	2.2 16V F CHIP
D501	–	–	–	–	10	10	10
CF101	5.5MHz	5.5MHz	5.5MHz	6.0MHz	5.5MHz	5.5MHz	6.0MHz
CF108	–	–	5.5MHz	–	5.5MHz	5.5MHz	6.0MHz
CF103	–	–	6.5MHz	–	–	–	–
CF101	147S63311	147S63311	147S63311	147S63311	125137211	125137211	125137211
IC102	–	–	–	–	μ2860B-BFP G3	μ2860B-BFP G3	μ2860B-BFP G3
IC103	–	–	NJM2521M	–	NJM2521M	NJM2521M	–
IC104	–	–	–	–	NJM2521M	–	–
IC601	–	–	–	–	PQ09RE11	PQ09RE11	PQ09RE11
L103	–	–	–	–	4.7μH 5% : EL0606	4.7μH 5% : EL0606	4.7μH 5% : EL0606
L104	–	–	–	–	4.7μH 5% : EL0606	4.7μH 5% : EL0606	4.7μH 5% : EL0606
Q102	–	–	–	–	2SA1037K	2SA1037K	2SA1037K
Q105	–	–	–	–	2SC4512K	2SC4512K	2SC4512K
Q106	–	–	–	–	2SA1037K	2SA1037K	2SA1037K
R102	–	–	–	–	10k : CHIP	10k : CHIP	10k : CHIP
R106	–	–	–	–	100 : CHIP	100 : CHIP	100 : CHIP
R107	–	–	–	–	100 : CHIP	100 : CHIP	100 : CHIP
R108	–	–	–	–	100 : CHIP	100 : CHIP	100 : CHIP
R109	–	–	–	–	10k : CHIP	10k : CHIP	10k : CHIP
R110	–	–	–	–	470 : CHIP	470 : CHIP	470 : CHIP
R113	–	–	–	–	27k : CHIP	27k : CHIP	27k : CHIP
R115	–	–	–	–	4.7k : CHIP	4.7k : CHIP	4.7k : CHIP
R118	–	100 : CHIP	100 : CHIP	–	–	100 : CHIP	–
R119	–	–	–	–	–	100 : CHIP	–
R124	–	–	–	–	22k : CHIP	22k : CHIP	22k : CHIP
R125	–	–	–	–	470 : CHIP	470 : CHIP	470 : CHIP
R126	–	–	–	–	220k : CHIP	220k : CHIP	220k : CHIP
R127	–	–	–	–	10k : CHIP	10k : CHIP	10k : CHIP
R130	–	–	–	–	10k : CHIP	10k : CHIP	10k : CHIP
R131	–	–	–	–	15k : CHIP	15k : CHIP	15k : CHIP
R133	0 : CHIP	–	–	0 : CHIP	–	–	0 : CHIP
R134	–	–	–	–	–	–	0 : CHIP
R139	–	–	–	–	6.8k : CHIP	6.8k : CHIP	6.8k : CHIP
R140	–	–	–	–	470 : CHIP	470 : CHIP	470 : CHIP
R141	–	–	–	–	10k : CHIP	10k : CHIP	10k : CHIP
R142	–	–	–	–	220 : CHIP	220 : CHIP	220 : CHIP
R144	–	–	100 : CHIP	–	–	–	–
R145	–	–	4.7k : CHIP	–	–	–	–
R146	–	–	–	–	100 : CHIP	100 : CHIP	100 : CHIP
R149	–	–	–	–	–	0 : CHIP	–
R150	–	0 : CHIP	–	–	–	0 : CHIP	–
R151	–	–	–	–	0 : CHIP	0 : CHIP	0 : CHIP
R153	10k : CHIP	10k : CHIP	10k : CHIP	10k : CHIP	–	–	–
R154	0 : CHIP	0 : CHIP	0 : CHIP	0 : CHIP	–	–	–
R155	0 : CHIP	0 : CHIP	0 : CHIP	–	–	–	–
R156	0 : CHIP	0 : CHIP	0 : CHIP	0 : CHIP	–	–	–
R157	–	–	–	–	0 : CHIP	0 : CHIP	0 : CHIP
R158	0 : CHIP	0 : CHIP	0 : CHIP	0 : CHIP	–	–	–
R416	–	–	–	–	22k : CHIP	22k : CHIP	22k : CHIP
R417	1k : CHIP	1k : CHIP	1k : CHIP	1k : CHIP	–	–	–
R636	–	–	–	–	220 : CHIP	220 : CHIP	220 : CHIP
RB01	–	–	–	–	22 1W : RS	22 1W : RS	22 1W : RS
TU101	TVF-01AEP	TVF-01FR	TVF-01AEP	TVF-01UK	TVF-01AEPP	TVF-01FRP	TVF-01UKP
TU102	–	–	–	–	TVF-01AEPP	TVF-01FRP	TVF-01UKP

– : Not mounted

A BOARD TRANSISTOR VOLTAGE LIST

	B	C	E
Q101	8.5	2.2	8.9
Q102	8.5	2.1	8.9
Q103	1.7	4.3	1.1
Q104	4.3	2.9	4.9
Q105	1.7	4.3	1.1
Q106	4.2	2.8	4.9
Q201	0.7	0	GND
Q301	4.6	GND	5.3
Q302	0	8.9	0
Q401	3.9	GND	4.4
Q402	3.9	6.4	3.3
Q403	3.7	8.9	5.8
Q404	1.1	GND	1.8
Q405	6.4	8.9	5.8
Q406	0	GND	0
Q407	0	GND	0
Q408	0.6	GND	0
Q601	0.6	5.4	GND
Q602	116.7	116.9	117.3
Q603	0.7	0.1	GND
Q622	-0.2	117.8	GND

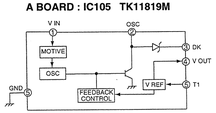
All voltages are in V.

A BOARD IC VOLTAGE LIST

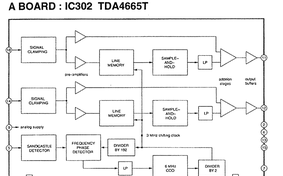
IC101	1	1.9	IC302	5	0.7	IC304	40	4.1	IC601	5	GND
	4	GND		8	GND		41	2.3	IC602	C	10.2
	6	2.1		9	5.1		42	2.5		O	11.53
	7	1.6		10	GND		43	1.7		G	GND
	8	2.0		11	3.0		44	8.8	IC603	1	12.4
	9	2.0		12	3.0		45	2.5		2	8.9
	10	1.8		14	1.5		46	4.0		3	GND
	11	4.3		16	1.4		47	3.1	IC604	1	13.5
	12	0	IC303	1	1.5		48	4.5		2	12.0
	13	4.9		5	8.2		50	4.7		3	GND
	14	1.8		6	GND		51	4.7		4	3.5
	15	1.8		9	3.5		52	4.1	IC605	1	13.5
	16	1.8		10	4.3		53	4.0		2	12.0
	17	1.6		11	5.7		54	5.0		3	GND
	18	1.6		12	2.9		55	3.6		4	3.5
	19	0.7		19	0.7		56	3.6	IC606	1	12.1
	20	1.5		20	1.5		59	8.8		2	GND
IC102	1	1.8	IC304	1	4.8		60	5.5		G	GND
	2	GND		2	GND		61	2.4	IC607	1	6.4
	3	5.6		3	5.6		62	7.1		2	5.3
	4	5.6		4	5.6		63	GND		3	GND
	5	3.8	IC401	1	3.5		4	3.5		4	3.5
	6	5.0		2	3.8	IC608	1	6.4			
	7	3.8		3	3.8		2	5.6			
	8	5.4		4	3.8		3	GND			
	9	GND		13	4.6		4	2.9			
	10	0.7		14	4.6	IC609	1	6.4			
	11	0		15	0		2	5.6			
	12	5.5		16	0.1		3	GND			
	13	5.4		17	3.6		4	2.7			
	14	5.4		18	3.6	IC610	1	-13.7			
	15	0.1		22	4.5		2	GND			
	16	0.1		23	3.7		O	-19.0			
	27	3.8		24	3.8	IC611	1	10.5			
	30	0		25	3.8		2	9.0			
	33	3.8		26	1.2		3	GND			
	34	3.7	IC402	1	1.2		4	3.5			
	36	3.8		2	3.3		5	1.4			
	38	8.9		3	5.1		6	1.4			
	41	3.8		4	GND		7	8.3			
	42	0		5	3.1		8	9.0			
	43	3.8		6	1.4						
	44	3.8		7	8.3						
IC501	1	GND		8	9.0						
	2	0.1									
	3	12.3	PH601	1	11.2						
	4	1.2		2	10.2						
	5	1.4		3	4.1						
	6	24.3		4	19.0						
	7	1.3	PH602	1	6.3						
IC601	1	1.7		2	5.2						
	2	0.1		3	4.7						
	3	0.3		4	-5.7						
	4	18.6									

All voltages are in V.
Pin numbers which are not described are not used.

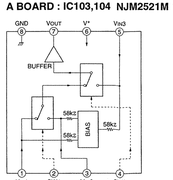
A BOARD : IC105 TK11819M



A BOARD : IC302 TDA4665T

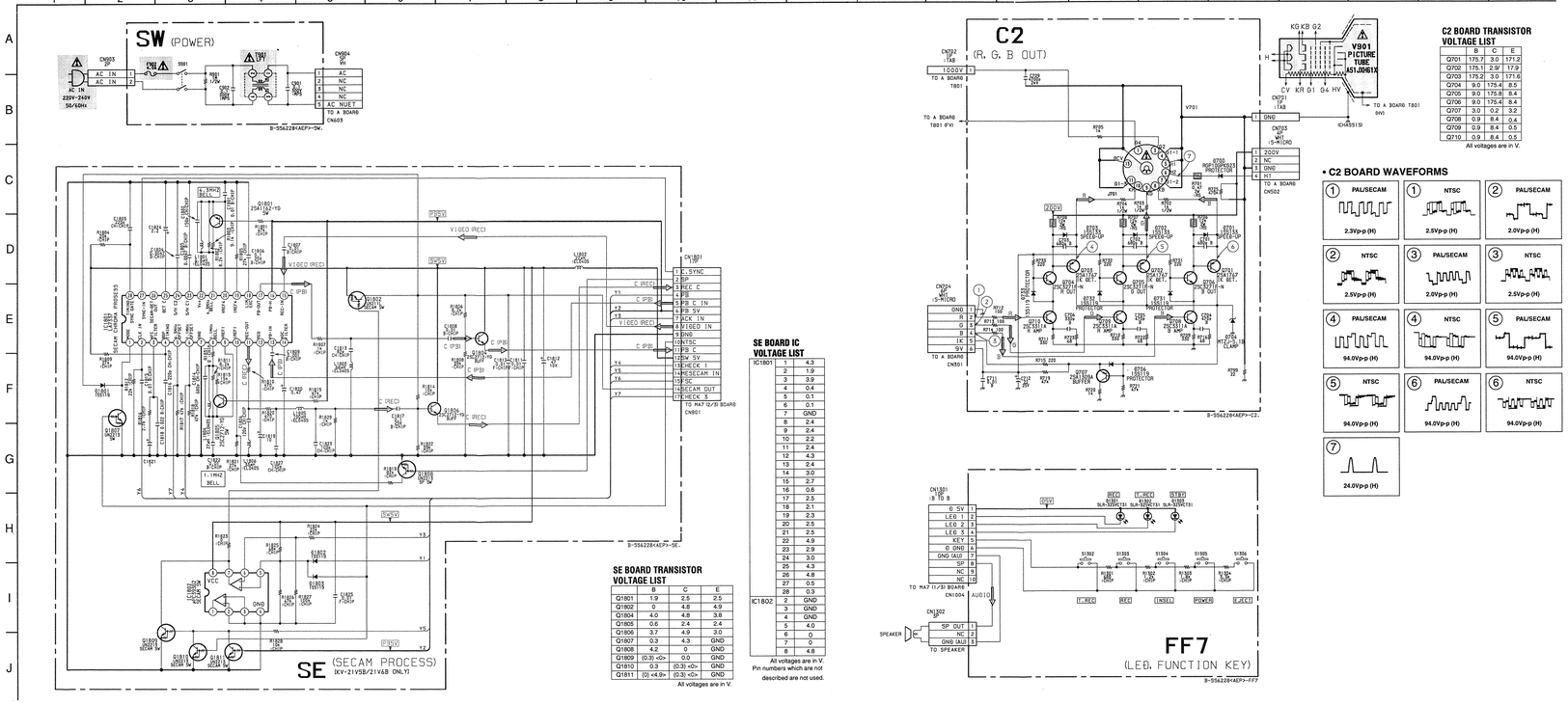


A BOARD : IC103,104 NJM2521M



Schematic diagrams
← A board

Schematic diagrams
C1 FF7 SE SW board →



SE BOARD TRANSISTOR VOLTAGE LIST

	B	C	E
Q1801	1.9	2.5	2.5
Q1802	0	4.8	4.9
Q1804	4.0	4.8	3.8
Q1805	0.6	2.4	2.4
Q1806	3.7	4.9	3.0
Q1807	0.3	4.3	GND
Q1808	4.2	0	GND
Q1809	(0.3) <0>	0.0	GND
Q1810	0.3	(0.3) <0>	GND
Q1811	(0) <4.9>	(0.3) <0>	GND

All voltages are in V.

SE BOARD IC VOLTAGE LIST

IC1801	1	4.3
	2	1.9
	3	3.9
	4	0.4
	5	0.1
	6	0.1
	7	GND
	8	2.4
	9	2.4
	10	2.2
	11	2.4
	12	4.3
	13	2.4
	14	3.0
	15	2.7
	16	0.6
	17	2.5
	18	2.1
	19	2.3
	20	2.5
	21	2.5
	22	4.9
	23	2.9
	24	3.0
	25	4.3
	26	4.8
	27	0.5
	28	0.3
IC1802	2	GND
	3	GND
	4	GND
	5	4.0
	6	0
	7	0
	8	4.8

All voltages are in V.
Pin numbers which are not described are not used.

C2 BOARD TRANSISTOR VOLTAGE LIST

	B	C	E
Q701	175.7	3.0	171.2
Q702	175.1	2.9/	17.9
Q703	175.2	3.0	171.6
Q704	9.0	175.4	8.5
Q705	9.0	175.8	8.4
Q706	9.0	175.4	8.4
Q707	3.0	0.2	3.2
Q708	0.9	8.4	0.4
Q709	0.9	8.4	0.5
Q710	0.9	8.4	0.5

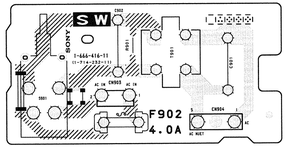
All voltages are in V.

• C2 BOARD WAVEFORMS

① PAL/SECAM 2.3Vp-p (H)	① NTSC 2.5Vp-p (H)	② PAL/SECAM 2.0Vp-p (H)
② NTSC 2.5Vp-p (H)	③ PAL/SECAM 2.0Vp-p (H)	③ NTSC 2.5Vp-p (H)
④ PAL/SECAM 94.0Vp-p (H)	④ NTSC 94.0Vp-p (H)	⑤ PAL/SECAM 94.0Vp-p (H)
⑤ NTSC 94.0Vp-p (H)	⑥ PAL/SECAM 94.0Vp-p (H)	⑥ NTSC 94.0Vp-p (H)
⑦ 24.0Vp-p (H)		

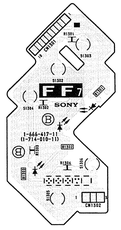
SW [POWER]

– SW BOARD –



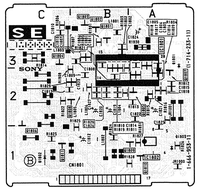
FF7 [LED, FUNCTION KEY]

– FF7 BOARD –



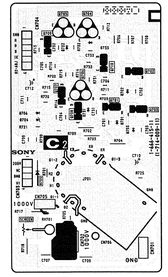
SE [SECAM PROCESS (KV-21V5B/V6B ONLY)]

– SE BOARD –



C2 [RGB OUT]

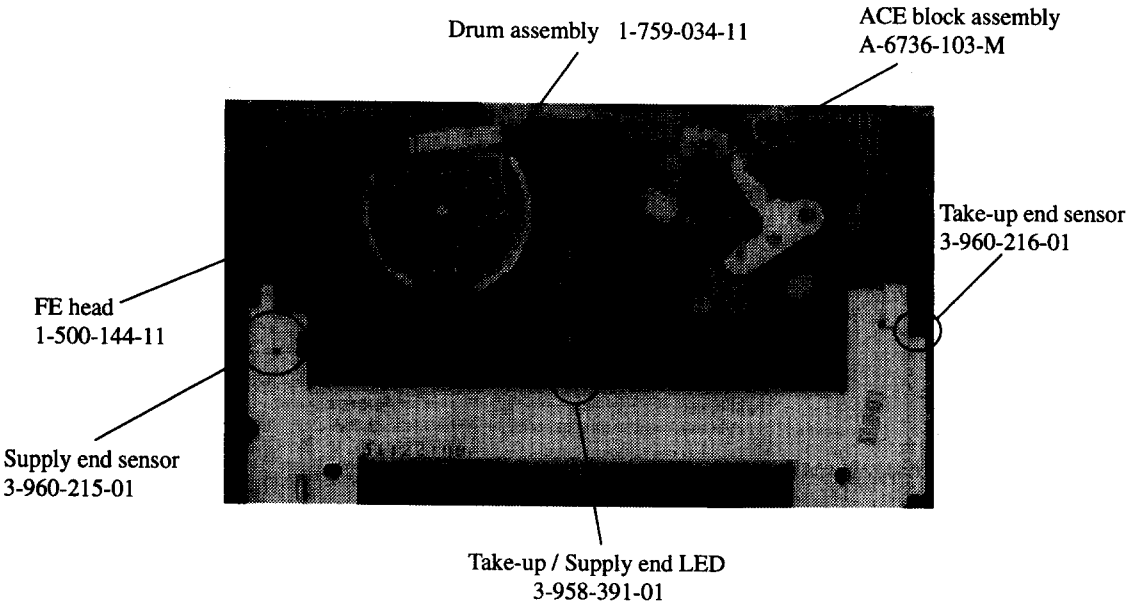
– C2 BOARD –



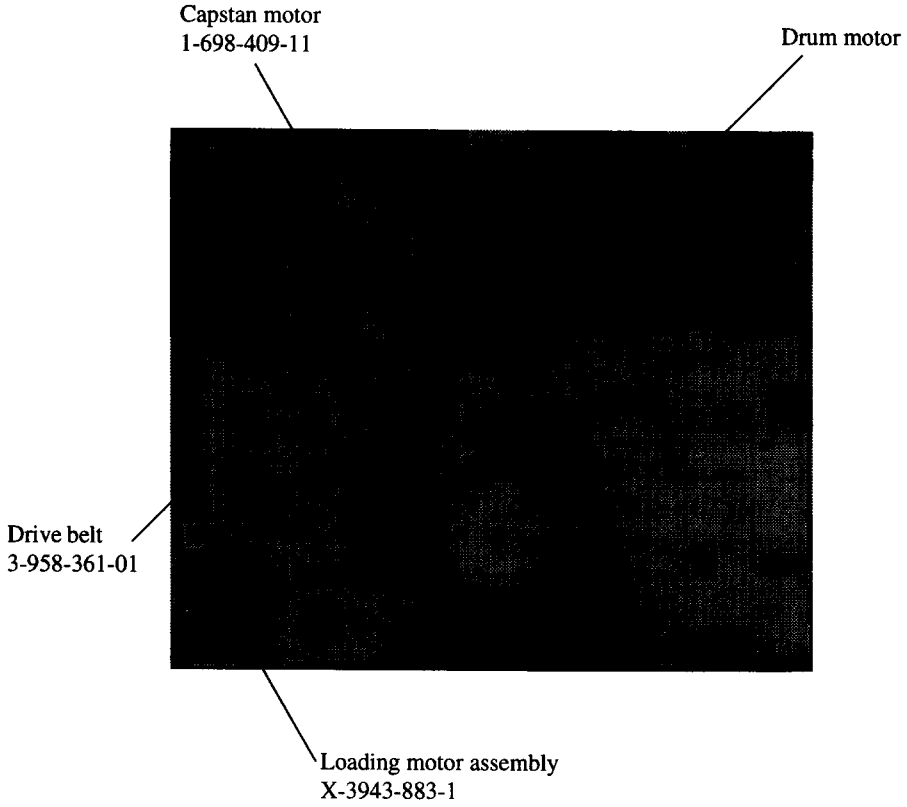
SECTION1
GENERAL

1-1. INTERNAL VIEWS

- Top Side -



- Buttom Side -



SECTION 2
CIRCUIT ADJUSTMENTS

Necessary items and indications for total adjustment of electric circuit of this unit will be described in this chapter.

2-1. Instruments to be Used

1) Color TV
2) Signal or dual trace type oscilloscope, band more than 30 MHz, delay, as provided.
3) Frequency counter (4 digits or more)
4) PAL pattern generater
5) Digital voltmeter
6) Audio level meter
7) Audio generator
8) Attenuator
9) Distortion meter
10) Alignment tape
    Part code : H7099052H (MH-2)

2-2. Connection

Unless otherwise specified, connect and adjust the measurement equipment as follows.

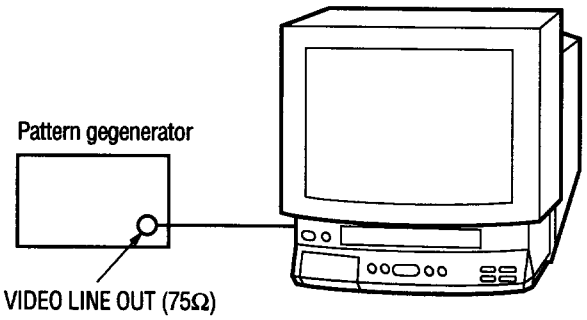


Fig. 2-1.

SWITCHING POSITION ADJUSTMENT

1. Play back the alignment tape (KRV-44PS).
2. During playback, short pins ② and ⑦ of CN1003 on MA7 board for a moment (approx. 0.5 sec).
3. Check LED blinking.
4. Press EJECT key one time for automatic adjustment.
5. Check if LED stopped blinking and the adjustment completed Eject the alignment tape.

2-3. Set-up for adjustment

The video signal from the pattern generator is used as adjustment signal for electrical adjustment. This video signal should meet the requirement. Connect the oscilloscpe to the video input terminal on the MF 1 board and make sure that the amplitudes of sync signal of video signal, video portion and burst signal are flat at approximately 0.3, 0.7 and 0.3 V, respectively, and that the level ratio of the burst signal and "red siganl" are 0.30 : 0.66, Fig. 2-2. shows video signals (color bars) used in adjusting the electrical adjustment.

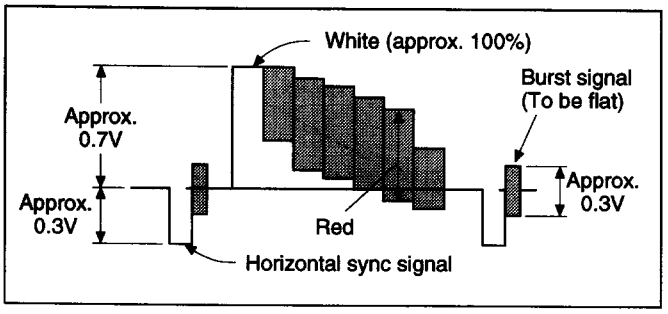


Fig. 2-2

Alignment Tape (MH-2)

	Time	Video signal	Audio signal
1	10 minutes	Starir-step	6 kHz
2	5 minutes	–	3 kHz
3	10 minutes	Color bar	1 kHz
4	3 minutes	RF sweep	–

2-4. Specified Input/Output Level Impedance

Input/Output terminal

Video input	Pin jack	
	Input signal	: 1Vp-p, 75Ω, unbalanced Sync negative
VIDEO LINE OUT	Pin jack	
	Output siganl	: 1Vp-p, 75Ω, unbalanced Sync negative
AUDIO LINE IN	Pin jack	
	Input level	: -7.5dBs (0dBs=0.775Vrms)
	Input impedance	: More than 47kΩ
AUDIO LINE OUT	Pin jack	
	Specified output	: -7.5dBs At 47kΩ loaded.
	Load impedance	: More than 10kΩ

3-1. SYSTEM CONTROL-VIDEO BLOCK INTERFACE (MA7 BOARD IC402)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREADING	TAPE UNTHREADING	PB	PB · PAUSE	SLOW	X2	PICTURE SEARCH CUE	PICTURE SEARCH REVIEW	REC	REC PAUSE
$\overline{V \cdot PB}$	IC402 ㊾	O	H	H	H	H	H	L	L	L	L	L	L	H	H
RF SW P (SW25)	IC402 ①	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
Q VD/V MUTE	IC402 ②	O	L	L	L	L	L	*2	*3	*3	*3	*3	*3	L	L
$\overline{NA \cdot SP}$	IC402 ㊹	O	*4	*4	*4	*4	*4	*5	*5	*5	*5	*5	*5	*4	*4
LP	IC402 ⑫	O	*8	*8	*8	*8	*8	*5	*5	*5	*5	*5	*5	*8	*8
REC·P	IC402 ④	O	L	L	L	L	L	L	L	L	L	L	L	L	H
REC	IC402 ㊾	O	L	L	L	L	L	L	L	L	L	L	L	H	H
V SYNC	IC402 ㊽	I	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
OSD MUTE	IC402 ㊷	O	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
CTL REC	IC402 ㊺	O	L	L	L	L	L	L	L	L	L	L	L	H	L
$\overline{NTSC}$	IC402 ⑤	O	L	L	L	L	L	L	L	L	L	L	L	L	L
JOG	IC402 ㊼	O	L	L	L	L	L	L	H	H	H	H	H	L	L
CRC SETTEI	IC402 ㊶	O	L	L	L	L	L	L	L	L	L	L	L	*9	*9

*1. 25Hz 50% duty pulse synchronizing with drum rotation.
*2. Normally "L" . "H" when the video signal is not detected.
*3. V period "H" pulse.
*4. "L" in the SP mode. Selected according to the recording mode.
*5. Selected according to the tape recording mode.

Mode / Signal	SP	LP	EP
$\overline{SP}$ ㊸	L	H	H

*6. Composite sync signal (positive).
*7. "H" when menu screen or gray back screen.
*8. Selected by REC mode, "L" in the SP mode.
*9. "H" while APC is set.

3-2. SYSTEM CONTROL-SERVO PERIPHERAL CIRCUIT INTERFACE (MA7 BOARD IC402)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREADING	TAPE UNTHREADING	PB	PB · PAUSE	SLOW	X2	PICTURE SEARCH CUE	PICTURE SEARCH REVIEW	REC	REC · PAUSE	PB INDEX WRT/ERS
REC CTL	IC402 ⑦	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	
$\overline{\text{CAP STOP}}$	IC402 ㉟	O (O.D)	L	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	L	*3	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	
STEP PLS	IC402 ㊳	O	L	L	L	L	L	L	L	*2	L	L	L	L	L	
CTL REC	IC402 ㊺	O	L	L	L	L	L	L	L	L	L	L	L	H	L	H
CTL INDEX	IC402 ㊾	O	L	L	L	L	L	L	L	L	L	L	L	L	L	H
PB CTL	IC402 ㊼	I	H	*6	*6			*1	H/L	*2	*6	*6	*6	*1	H	
DRUM PG	IC402 ㊽	I	*4	*7	*7	*5	*5	*7	*7	*7	*7	*7	*7	*7	*7	
DRUM FG	IC402 ㊿	I	*4	*8	*8	*5	*5	*8	*8	*8	*8	*8	*8	*8	*8	
CAP FG	IC402 ⑦⓪	I	H/L	*6	*6	*5	*5	*6	H/L	*9	*6	*6	*6	*6	H/L	
CAP DA	IC402 ⑦③	O	*10	*10	*10	*10	*10	*11	*10	*10	*11	*11	*11	*11	*10	
DRUM DA	IC402 ⑦④	O	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	
CTL STEP	IC402 ⑦⑥	O	L	L	L	L	L	L	L	*13	L	L	L	L	L	

*1. 25Hz pulse.
*2. Pulse in tape running.
*3. Reverse logic pulse of STEP PLS.
*4. "L" when drum rotation stops.
*5. Unstable period pulse.
*6. Pulse of period proportionate to tape speed.
*7. 25Hz pulse.
*8. 300Hz pulse.
*9. Pulse in tape running.
*10. Approx. 2 msec. period "H" or "L" pulse.
*11. Approx. 1.5 msec. period "H" or "L" pulse.
*12. Approx. 3 msec. period "H" or "L" pulse.
*13. "H" in FWD direction and STEP drive.

3-3. SYSTEM CONTROL-MECHANISM BLOCK INTERFACE (MA7 BOARD IC402)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TAPE THREADING	TAPE UNTHREADING	STOP	FF	REW	PB	PB · PAUSE	SLOW	X2	PICTURE SEARCH CUE	PICTURE SEARCH REVIEW	REC	REC · PAUSE
CAM LOAD	IC402 ⑬	O	L	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L
CAM UNLOAD	IC402 ⑭	O	L	L	H	L	H	L	L	L	L	L	L	L	L	L	L	L
CAM 12V	IC402 ㉛	O		H	L	H	L											
MODE 1	IC402 ㉚	I	H	L	L	*1	*1	H	H	H	H	H	H	H	H	L	H	H
MODE 2	IC402 ㉙	I	L	L	L	*1	*1	L	L	L	H	H	H	H	H	H	H	H
MODE 3	IC402 ㉘	I	L	L	L	*1	*1	H	H	H	L	H	H	L	L	H	L	H
MODE 4	IC402 ㉗	I	L	H	H	*1	*1	H	L	L	L	L	L	L	L	L	L	L
REC PRF	IC402 ⑮	I	L	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
T REEL FG	IC402 ㉞	I	H/L	H/L	H/L	H/L	H/L	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
S REEL FG	IC402 ㉝	I	H/L	H/L	H/L	*3	*3	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
T/Y LED	IC402 ㉜	O (O.D)	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP TRQ 1	IC402 ㉞	O (O.D)											*1					
CAP TRQ 2	IC402 ㉝	O (O.D)										L	*1					L
CAP TRQ 3	IC402 ⑧	O (O.D)							H	H			*1		H	H		
$\overline{\text{CAP STOP}}$	IC402 ㉟	O (O.D)	L	L	L	H	H	L	H	H	H	L	*5	H	H	H	H	L
CAP RVS	IC402 ⑫	O	H			L	H	H/L	L	H	L	L	L/*5	L	L	H	L	L
CAP DA	IC402 ⑬	O																
T SENS	IC402 ㊶	I	*4	*4	*4	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
S SENS	IC402 ㊷	I	*4	*4	*4	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7

*1. Uncertainty
*2. "L" when the erasing protection tab is bent,"H" when not bent.
*3. Pulse of period proportionate to reel rotationg speed.
*4. Approx. 2 msec. period "H" pulse.
*5. Pulse in tape running.
*6. "L" only in tape running and when CAP RVS is "H".
*7. Nomally "L". 2 msec. poriod "H" pulse when tape top or tape end is detected.

3-4. SYSTEM CONTROL-SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA7 BOARD IC402)

Signal	Pin No.	I/O	I/O Level
$\overline{\text{ASURA RESET}}$	IC402 ㊵	I	Normally "H"."L" when service interruption is detected or restored.
$\overline{\text{ASURA CS}}$	IC402 ㊹	I	Chip select signal from the timer microprocessor.V period "L" pulse.
S IN 0	IC402 ㊺	I	Serial communication data from the timer microprocessor.V period "L" pulse.
S OUT 0	IC402 ㊻	O	Serial communication data to the timer microprocessor.V period "L" pulse.
$\overline{\text{S CLK}}$	IC402 ㊼	I	Serial communication clock with the timer microprocessor.V period "L" pulse.

3-5. SYSTEM CONTROL-AUDIO BLOCK INTERFACE (MA7 BOARD IC402)

	Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREADING	TAPE UNTHREADING	PB	PB · PAUSE	SLOW	X2	PICTURE SEARCH CUE	PICTURE SEARCH REVIEW	REC	REC · PAUSE
	AF ENVELOP	IC402 ㊾	I	AF RF envelope signal input pin for auto tracking.												
	NA PB	IC402 ㊿	O	L	L	L	L	L	H	H	H	H	H	H	L	L
	A MUTE	IC402 (52)	O (O.D)	L	L	L	L	L	*1	H	H	H	H	H	L	L
	$\overline{\text{NA SP}}$	IC402 (54)	O	*2	*2	*2	*2	*2	*3	*3	*3	*3	*3	*2	*2	*2
	NA REC.$\overline{\text{P}}$	IC402 ⑪	O	L	L	L	L	L	L	L	L	L	L	L	H	L
*4	AF REC.$\overline{\text{P}}$	IC402 ④	O	L	L	L	L	L	L	L	L	L	L	L	H	L
*4	AF SWP	IC402 ⑱	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
	AF SW POSITION	IC402 (51)	I	Input pin for AF switching position adjustment.												
*4	$\overline{\text{FULL ERS}}$	IC402 (56)	O (O.D)	H	H	H	H	H	H	H	H	H	H	H	L	H

*1. 25Hz 50% duty pulse approximately 5 msec. delayed from RF SW P.
*2. Selected according to SP/LP selector. "L" in the SP mode, "H" in the LP mode.
*3. Selected according to the tape recording mode. "L" in the SP mode, "H" in the LP mode.
*4. Not used.

3-6. SYSTEM CONTROL-RF MODULATOR, INPUT SELECTION BLOCK INTERFACE (MA7 BOARD IC402)

	Signal	Pin No.	I/O	I/O Level TUNER	I/O Level LINE 1	I/O Level LINE 2
	LINE 1	IC402 (53)	O	L	H	L
*1	LINE 2	IC402 (52)	O	L	L	H

*1. Not used.

3-7. SERVO/SYSTEM CONTROL MICROPROCESSOR (MA7 BOARD IC402) PORT FUNCTION DESCRIPTION

Pin No.	Signal	I/O	Function
1	RF SWP	O	RF switching pulse.
2	QVD	O	False VD.
3	QHD ENBL	O	False HD voltage level control.
4	AF REC P	O	Hi-Fi recording control. (Not used. (open))
5	NTSC	O	H : PAL.
6	FE ON	O	Flying erase. (Not used. (open))
7	REC CTL	I/O	REC CTL.
8	CAP TRQ3	O	Capstan current control.
9	APC2	O	
10	APC1	I/O	
11	NA REC P	I/O	Normal audio recording mode. H : recording mode.
12	SP EP/LP	O	Tape speed control.
13	CAM LOAD	I/O	Loading motor rotaing direction control.
14	CAM UNLOAD	I/O	Loading motor rotaing direction control.
15	C IN(REC PRF)	O	Cassette IN and erasing protection tad detection switch input.
*1 16	RENTAL	I/O	H : poor tape.
17	SECAM	O	H : SECAM (Not used. (open))
18	PAL SP	O	H : PAL (Not used. (open))
19	3.58 NTSC	O	Tuner, audio selection signal. H : 3.58 XTAL. (Not used. (open))
20	NT JUDGE	I	4.43/3.58 judge input. (Not used. (open))
21	BLUE BACK ON	I/O	H : ME SECAM (Not used. (open))
22	PAL 60	O	H : HTSC on PAL TV. (Not used. (open))
23	TV VTR	O	Not used. (open)
24	AV CONT	O	ON/OFF control. (Not used. (open))
25	C+CONT	O	CANAL + control. (Not used. (open))
26	BIL	O	H output : BS bilingual mode. (Not used. (open))
27	MODE 4	I	Cam encorder data 4.
28	MODE 3	I	Cam encorder data 3.
29	MODE 2	I	Cam encorder data 2.
30	MODE 1	I	Cam encorder data 1.
31	CAM 12V	O	CAM motor voltage change.
32	TYP LED	O	Top/end detection lamp lighting control.
33	CAP TRQ 2	O	Capstan current control signal 2. L : FF/REW to STOP.
34	CAP TRQ 1	O	Capstan current control signal 1. L : SLOW speed down.

Pin No.	Signal	I/O	Function
35	CAP STOP	O	Capstan stop reversal. L : Capstan stop.
36	FULL ERS	O	Full erase control. (Not used. (GND))
37	N.C.		GND.
38	N.C.		GND.
39	MP	I	Fixed to L.
40	ASURA RESET	I	System reset input.
41	VSS		GND.
42	XTAL	I	System clock 16MHz.
43	EXTAL	O	System clock 16MHz.
44	ASURA CS	I	Chip select signal.
45	S IN 0	I	Serial communication signal.
46	S OUT 0	O	Serial communication signal.
47	S CLK	I	Serial clock inpt.
48	NICOLE ON	O	Not used. (open)
49	F MONO C	O	Not used. (open)
50	EDIT	O	EDIT control. (Not used. (open))
51	TRINITRON	I	GND.
52	A VSS	I	GND.
53	A VREF	I	AD port reference input. (UNSW 5V)
54	A VDD	I	UNSW 5V.
55	APC ERROR	I	AD input for APC 2.
56	NT PB SW	I	GND.
57	DEST 2 (DEW)	I	Destination judge input. Fixed to L.
58	DEST 1	I	Destination judge input.
59	AF ENV	I	Hi-Fi audio playback signal envelope.
60	RF ENV	I	Video playback signal envelope.
61	T SENS	I	Tape top sensor input.
62	S SENS	I	Tape end sensor input.
63	S REEL FG	I	S side reel FG input.
64	T REEL FG	I	T side reel FG input.
65	N.C.		Not used. (open)
66	V SYNC	I	Composite sync input.
67	PB CTL	I	Servo CTL input.
68	DRM PG	I	Drum PG input.

Pin No.	Signal	I/O	Function
69	DRM FG	I	Drum FG input.
70	CAP FG	I	Capstan FG input.
71	N.C.	O	Not used. (open)
72	CAP RVS	O	Capstan reverse control. H : Reverse.
73	CAP DA	O	Capstan D/A output.
74	DRM DA	O	Drum D/A output.
75	CTL REC	O	H : CTL write.
76	CTL STEP	O	"CTL amp, STEP operation control."
77	N.C.		Not used. (open)
78	N.C.		Not used. (open)
79	CTL INDEX	O	Index control signal rewrite. H : Erase.
80	SO 1	I/O	Expanded port data.
81	SCK 1	I/O	Expanded port clock.
82	LINE 2	O	Input selection control signal. (Not used. (open))
83	LINE 1	O	Input selection control signal. (Not used. (open))
84	APC PW	O	PWM output for APC2. (Not used. (open))
85	N.C.		Not used. (open)
86	N.C.		Not used. (open)
87	N.C.		Not used. (open)
88	VSS		GND.
89	VDD		UNSW 5V.
90	N.C.		UNSW 5V.
91	ORC SETTEI	O	H : ORC measure.
92	A MUTE	O	Audio mute. H : mute.
93	$\overline{SP}$	O	L : SP mode.
94	NA $\overline{SP}$	O	For normal audio. L : SP mode.
95	NAPB	O	Audio output control signal. H : Normal audio playback.
96	AF REC		Not used. (open)
97	$\overline{JOG}$	O	H : JOG
98	$\overline{V\ PB}$	O	Video system playback mode reversal. L : Playback.
99	STEP PLS	O	"Step pulse, H : Capstan step driving."
100	AF SWP	O	AF switching pulse. (Not used. (open))

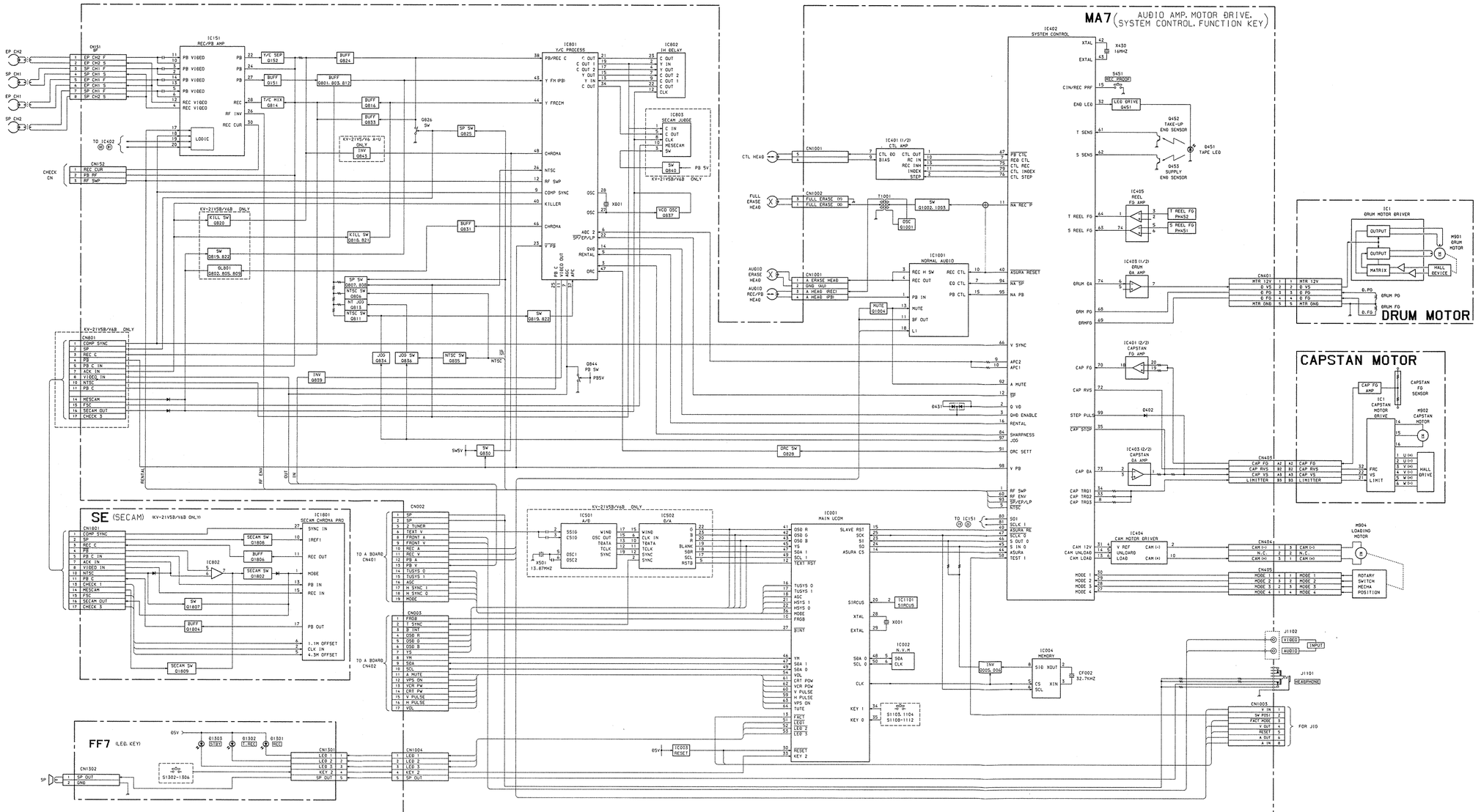
*1. Selected by tape condition.

tape / signal	good	normal	poor
RENTAL ⑯	L	L	H

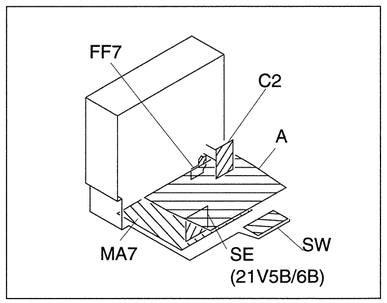
VTR SECTION

SECTION 4
DIAGRAMS

4-1. BLOCK DIAGRAM



4-2. CIRCUIT BOARDS LOCATION



4-3. PRINTED WRING BOARDS AND SCHEMATIC DIAGRAMS

Note:

- Capacitors are with out voltage indication are all 50V.
- All electrolytics are in 50V unless otherwise specified.
- All resistors are in ohms.
  kΩ=1000Ω, MΩ=1000kΩ
- Indication of resistance, which dose not have one for rating electrical power, is as follows.

  Pitch : 5mm
  Rating electrical power : 1/4W
- : nonflammable resistor.
- : fusible resistor.
- △ : internal component.
- : panel designation and adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- As to the voltage volue shown by the semiconductors on the Shematic Diagram, see the another list
- Readings are taken with a color-bar signal input.
- Readings are taken with a 10MΩ digital multimeter.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
  * : Measurement impossibility.
- : B+line.
- : B-line.
  (Actual measured value may be different).
- : signal path. (RF)
- Circled numbers are waveform references.
- Measurement mode.
  mo mark : REC/PB mode
  ( ) : REC mode
  < > : PB mode

Reference information

RESISTOR : RN METAL FILM
: RC SOLID
: FPRD NONFLAMMABLE CARBON
: FUSE NONFLAMMABLE FUSIBLE
: RW NONFLAMMABLE WIREWOUND
: RS NONFLAMMABLE METAL OXIDE
: RB NONFLAMMABLE CEMENT
: ※ ADJUSTMENT RESISTOR

COIL : LF-8L MICRO INDUCTOR

CAPACITOR : TA TANTALUM
: PS STYROL
: PP POLYPROPYLENE
: PT MYLAR
: MPS METALIZED POLYESTER
: MPP METALIZED POLYPROPYLENE
: ALB BIPOLAR
: ALT HIGH TEMPERATURE
: ALR HIGH RIPPLE

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Terminal name of semiconductors in silk screen printed circuit (*)

	Device	Printed symbol	Terminal name	Circuit
①	Transistor	T	Collector / Base T Emitter	
②	Transistor	—	Collector / Base Emitter	
③	Diode		Cathode Anode	
④	Diode	T	Cathode / Anode (NC)	
⑤	Diode	—	Cathode / Anode (NC)	
⑥	Diode	T	Common / Anode T Cathode	
⑦	Diode	—	Common / Anode Cathode	
⑧	Diode	T	Common / Anode T Anode	
⑨	Diode	—	Common / Anode Anode	
⑩	Diode	T	Common / Cathode T Cathode	
⑪	Diode	—	Common / Cathode Cathode	
⑫	Transistor (FET)		Drain Source Gate	
⑬	Transistor (FET)		Drain Source Gate	
⑭	Transistor (FET)		Source Drain Gate	
⑮	Transistor		Emitter Collector Base	
–	Discrete semiconductot			

(Chip semiconductors that are not actually used are included.)

Ver 1.4

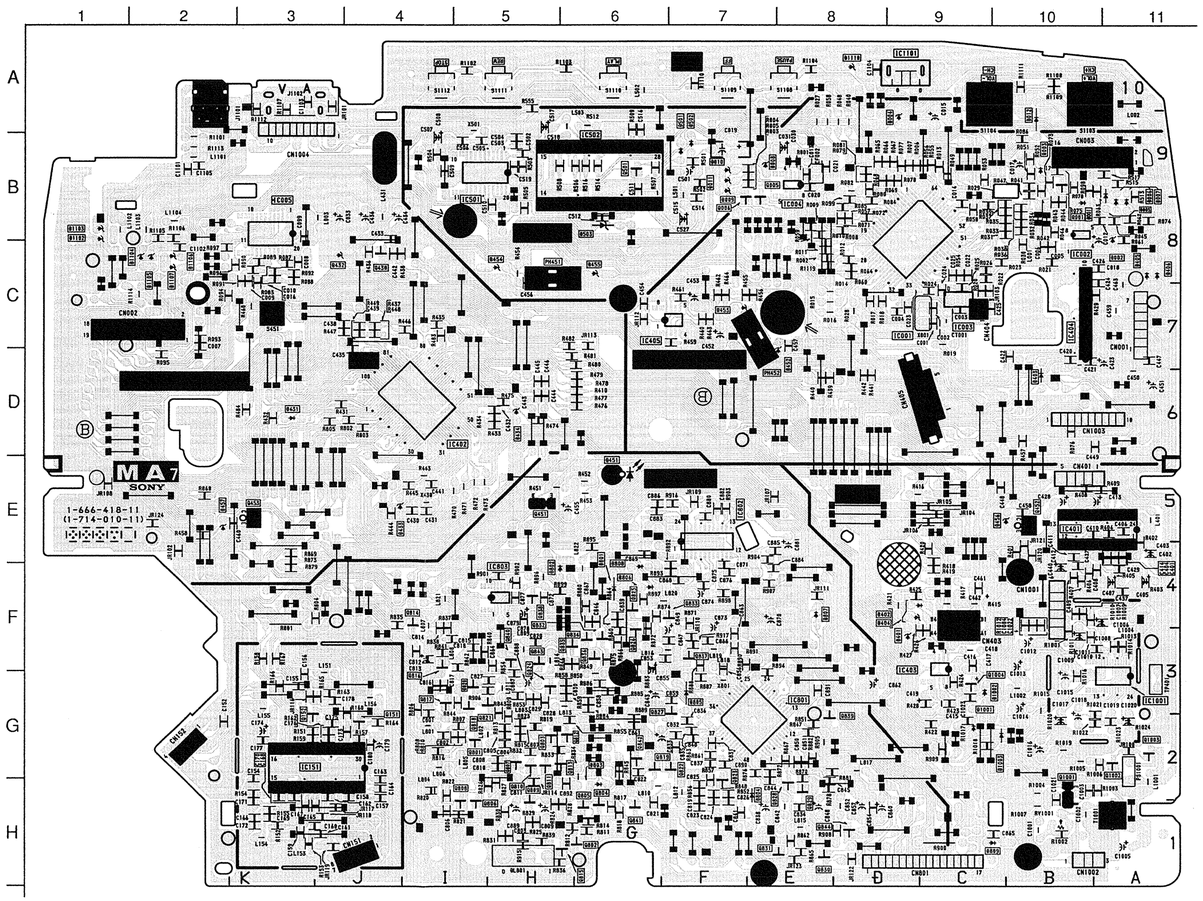
MA7 (1/3) [AUDIO AMP, MOTOR DRIVE, SYSTEM CONTROL, FUNCTION KEY] **MA7 (2/3)** [Y/C PROCESSOR] **MA7 (3/3)** [HEAD AMP]

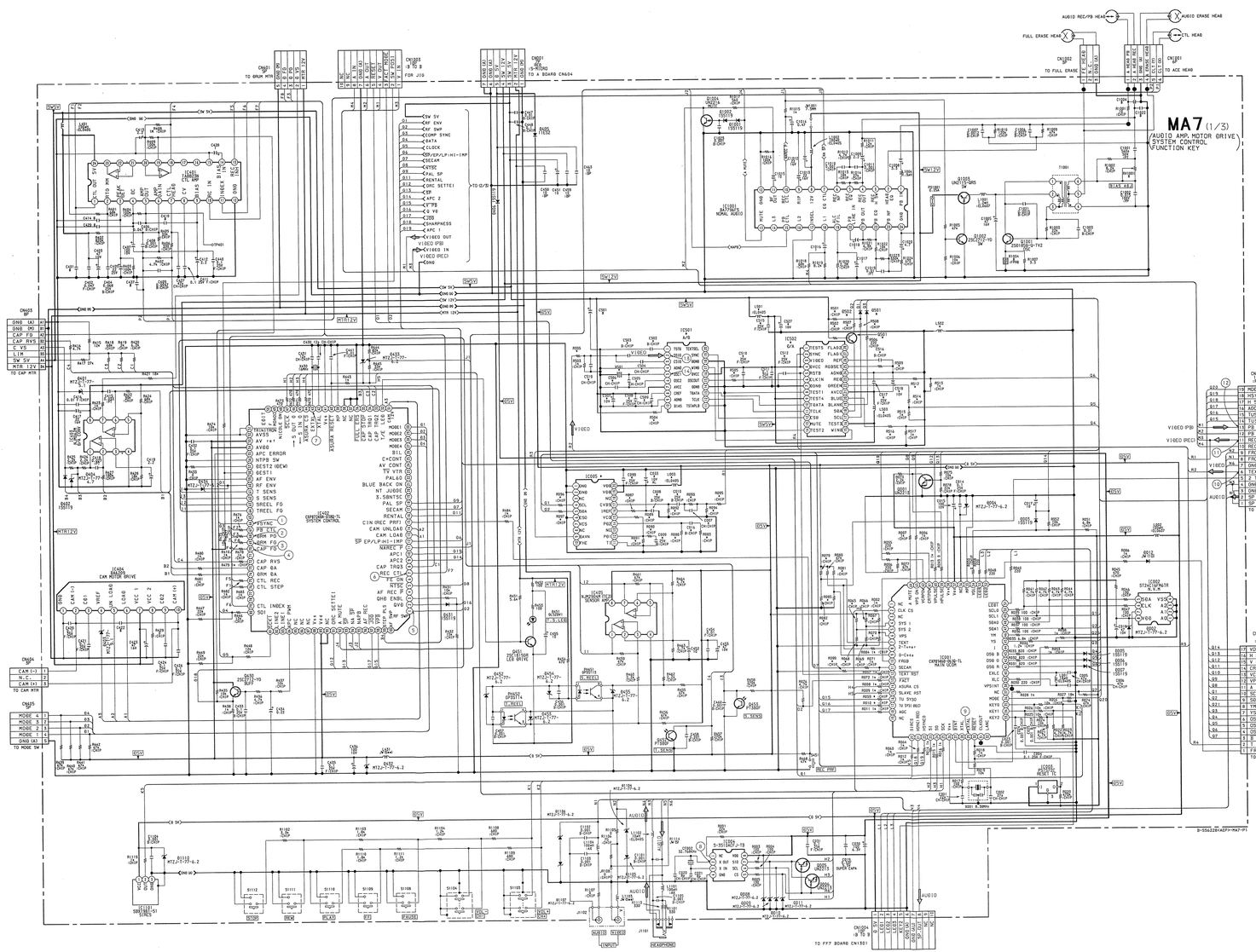
– MA7 BOARD –

MA7 BOARD

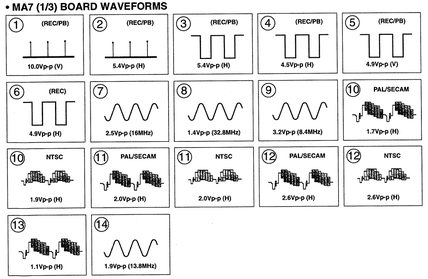
DIODE		*
D002	C-11	–
D003	B-10	–
D004	A-9	–
D005	B-11	–
D006	B-11	–
D007	B-11	–
D008	B-7	–
D009	B-7	–
D010	B-7	–
D011	B-7	–
D401	H-9	–
D402	F-9	–
D403	D-10	–
D404	F-9	–
D405	C-11	–
D406	C-11	–
D431	D-3	–
D432	C-3	–
D433	E-4	–
D434	D-5	–
D451	E-6	–
D452	D-8	–
D453	C-7	–
D454	C-5	–
D455	C-6	–
D501	B-7	–
D502	B-7	–
D801	F-6	–
D802	F-6	–
D803	H-6	–
D804	G-8	–
D805	H-7	–
D806	F-6	–
D807	F-8	–
D808	F-6	–
D1001	G-9	–
D1002	G-9	–
D1110	A-8	–
IC		
IC001	B-9	
IC002	C-10	
IC003	C-9	
IC004	B-8	
IC151	G-3	
IC401	E-10	
IC402	D-4	
IC403	F-9	
IC404	C-10	
IC405	C-7	
IC501	B-5	
IC502	B-6	
IC801	G-7	
IC802	F-7	
IC803	F-6	
IC1001	G-11	

IC1101	A-9	
TRANSISTOR		*
Q001	B-10	①
Q005	B-7	①
Q006	B-7	①
Q151	G-4	①
Q152	G-3	①
Q430	C-4	①
Q451	E-5	-
Q452	E-10	①
Q453	E-3	-
Q501	B-6	①
Q801	G-4	①
Q802	H-6	①
Q803	G-5	①
Q804	H-6	①
Q805	H-5	①
Q806	H-5	①
Q807	H-4	①
Q808	G-5	①
Q809	H-5	①
Q810	H-4	①
Q811	G-4	①
Q812	G-6	①
Q813	G-4	①
Q814	F-4	①
Q815	H-5	①
Q816	F-4	①
Q818	G-4	①
Q819	G-5	①
Q820	G-5	①
Q821	G-4	①
Q822	H-5	①
Q824	G-5	①
Q825	F-5	①
Q826	G-6	①
Q827	H-8	①
Q828	H-8	①
Q829	G-8	①
Q830	H-9	①
Q831	H-8	①
Q832	G-6	①
Q833	H-6	①
Q834	E-7	①
Q835	F-6	①
Q836	E-7	①
Q837	H-7	①
Q839	F-9	①
Q840	F-6	①
Q843	-5	①
Q844	H-8	①
Q1001	H-10	-
Q1002	G-11	①
Q1003	G-11	①
Q1004	G-9	①

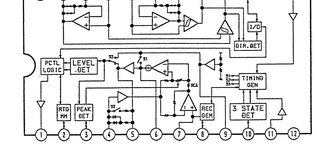




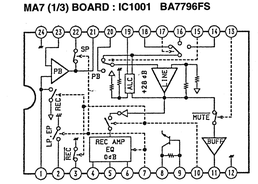
• MA7 (1/3) BOARD WAVEFORMS



MA7 (1/3) BOARD : IC401 TA8823N



MA7 (1/3) BOARD : IC1001 BA7796FS



MA7 (1/3) BOARD : IC404 BA6209

MA7 (1/3) BOARD IC VOLTAGE LIST

IC001	2	0.2	IC005	5	4.7	IC402	57	4.8	IC501
	4	4.9		6	GND		58	4.8	
	5	4.9		9	4.8		59	GND	
	6	4.9		11	0		60	(0.4) <1.7>	
	7	4.9		12	4.7		61	4.8	
	8	4.9		14	4.6		62	4.8	IC502
	9	4.9		15	4.7		63	*	
	10	0		16	1.4		64	*	
	11	1.1		17	0.9		65	0.6	
	12	4.9		19	4.8		67	(4.6) <3.1>	
	13	4.9		20	4.8		69	0.6	
	14	4.4	IC401	1	2.6		69	2.6	
	15	4.8		2	0.2		70	2.3	
	16	4.8		3	(1.3) <1.7>		72	0.2	
	17	4.8		4	1.0		73	2.5	
	18	4.8		5	1.0		74	2.5	
	20	4.8		6	1.0		75	(4.8) <0>	
	21	0.3		7	(2.6) <2.5>		76	0	
	22	0.3		8	(2.6) <2.5>		79	0	
	23	0.1		9	2.5		80	4.5	
	24	0.1		10	(2.6) <2.5>		81	4.7	
	25	1.3		11	0.2		84	(3.3) <4.0>	
	26	GND		12	GND		88	GND	
	27	(0.6) <4.8>		13	4.8		89	4.8	
	28	2.4		14	2.3		90	4.8	
	29	2.2		15	GND		91	0	
	30	4.8		18	2.1		92	0.2	
	32	4.8		19	2.4		93	0.2	
	33	4.8		20	2.4		94	(0.2) <4.8>	
	34	4.8		24	4.8		95	(0.2) <4.8>	
	35	4.8	IC402	1	2.2		97	4.8	
	36	(3.3) <2.3>		2	0.2		98	(4.8) <0.1>	
	37	4.8		3	0.2		99	0.2	
	38	4.8		5	4.8	IC403	1	2.8	
	39	2.8		7	(3.3) <2.7>		2	2.5	
	40	2.8		8	1.7		3	2.5	
	41	0		9	0.2		4	GND	
	42	0		10	4.8		5	2.5	
	43	0		11	(4.8) <0.3>		6	2.5	
	45	0.2		12	0.2		7	2.5	
	46	0		13	0.2		8	11.8	
	47	4.7		14	0.2	IC404	1	GND	
	48	4.7		15	4.8		2	0.7	
	49	4.7		16	2.1		3	1.0	
	50	16:48		17	0.2		4	3.4	
	51	0.6		18	4.8		5	0.2	
	52	4.0		19	0.2		6	0.2	
	53	1.0		20	0.2		7	12.0	
	54	0.5		29	4.8		8	12.0	
	55	GND		30	4.8		9	1.0	
	56	4.8		31	0.2		10	0.7	
	57	4.8		32	0.6	IC405	1	Ā/L	
	58	GND		33	1.5		2	1.8	
	59	4.0		34	1.5		3	Ā/L	
	60	0.1		35	2.7		4	GND	
	61	4.3		36	GND		5	*	
	62	4.0		37	GND		6	1.8	
	63	0.2		38	GND		7	*	
	64	4.8		39	GND		8	4.8	
IC002	1	GND		40	4.8	IC501	1	2.4	
	2	GND		41	GND		2	2.6	
	3	GND		42	2.9		3	1.1	
	4	GND		43	2.2		4	0	
	5	4.7		44	4.4		5	2.1	
	6	4.7		45	2.6		6	3.1	
	7	GND		46	2.5		7	GND	
	8	4.8		47	2.8		8	1.54	PH452
IC003	1	4.8		51	GND		9	0	
	G	GND		52	GND		10	1.7	
	O	4.8		53	4.8		11	GND	
IC005	1	GND		54	4.8		12	0	
	2	GND		55	(2.4) <2.9>		13	0	
	4	4.7		56	GND		14	GND	

IC501	15	2.4	
	16	4.9	
	17	0.3	
	18	GND	
	19	4.5	
IC502	1	4.9	
	2	3.5	
	4	4.9	
	5	4.8	
	6	2.4	
	7	GND	
	8	GND	
	9	4.9	
	10	0	
	11	0	
	12	4.5	
	14	GND	
	15	0.3	
	16	4.9	
	17	4.8	
	18	4.4	
	19	0	
	20	0	
	21	4.9	
	22	0.1	
	23	0	
	24	GND	
	25	1.4	
	26	1.4	
IC902	1	5.2	
	2	0.9	
	3	0.6	
	4	GND	
	5	5.2	
	6	1.1	
	7	0.5	
	8	5.2	
IC1001	1	2.1	
	2	0	
	3	0	
	4	5.7	
	5	5.7	
	6	5.6	
	7	(4.8) <0.2>	
	8	11.9	
	9	11.7	
	10	(0.3) <4.8>	
	11	5.6	
	12	GND	
	13	0.2	
	15	(0.2) <5.4>	
	17	0	
	18	5.6	
	19	0.2	
	20	5.6	
	21	2.2	
	22	2.2	
	23	2.2	
	24	0	
IC1101	1	4.9	
	2	4.9	
	3	GND	
PH451	1	1.3	
	2	2.6	
	3	Ā/L	
	4	GND	
PH452	1	1.3	
	2	GND	
	3	0	
	4	*	

All voltages are in V.
*:Can not measured.
Pin numbers which are not described are not used.

MA7 (1/3) BOARD TRANSISTOR VOLTAGE LIST

	B	C	E
Q001	0.8	4	0.1
Q005	0.2	0.5	0.1
Q006	0.2	0.5	0.1
Q430	(3.5) <3.4>	4.8	(2.6) <2.7>
Q451	0.6	11.2	GND
Q452	*	4.8	GND
Q453	*	4.8	GND
Q501	4.3	4.5	4.4
Q1001	0.3	(11.0) <0.4>	(0.3) <0>
Q1002	(0.7) <0>	(0.2) <11.3>	GND
Q1003	(0.2) <11.3>	(11.5) <0.4>	11.9
Q1004	0	-0.2	9.4

All voltages are in V.
*:Can not measured.

MA7 (1/3) BOARD ＊MARK LIST

	KV-21VS8/21VE8/21VA8/21VWE	KV-21VSB21V6B	KV-21VSD21V6D	KV-21V5K	KV-21V5U/21V6U
C007	–	150p CH : CHIP	150p CH : CHIP	–	150p CH : CHIP
C008	–	0.047 25V B : CHIP	0.047 25V B : CHIP	–	0.047 25V B : CHIP
C009	–	0.033 25V B : CHIP	0.033 25V B : CHIP	–	0.033 25V B : CHIP
C010	–	0.033 25V B : CHIP	0.033 25V B : CHIP	–	0.033 25V B : CHIP
C016	–	0.0022 B : CHIP	0.0022 B : CHIP	–	0.0022 B : CHIP
C033	–	100 10V	100 10V	–	100 10V
C099	–	0.1 25V F : CHIP	0.1 25V F : CHIP	–	0.1 25V F : CHIP
C502	0.022 B : CHIP	0.022 B : CHIP	0.022 B : CHIP	–	0.022 B : CHIP
C503	0.022 B : CHIP	0.022 B : CHIP	0.022 B : CHIP	–	0.022 B : CHIP
C504	200p CH : CHIP	100p CH : CHIP	200p CH : CHIP	–	200p CH : CHIP
C505	15p CH : CHIP	15p CH : CHIP	15p CH : CHIP	–	15p CH : CHIP
C506	15p CH : CHIP	15p CH : CHIP	15p CH : CHIP	–	15p CH : CHIP
C507	100 10V	100 10V	100 10V	–	100 10V
C508	0.1 25V F : CHIP	0.1 25V F : CHIP	0.1 25V F : CHIP	–	0.1 25V F : CHIP
C509	200p CH : CHIP	220p CH : CHIP	200p CH : CHIP	–	220p CH : CHIP
C510	0.1 25V F : CHIP	0.1 25V F : CHIP	0.1 25V F : CHIP	–	0.1 25V F : CHIP
C512	0.1 25V F : CHIP	0.1 25V F : CHIP	0.1 25V F : CHIP	–	0.1 25V F : CHIP
C515	0.1 25V F : CHIP	0.1 25V F : CHIP	0.1 25V F : CHIP	–	0.1 25V F : CHIP
C516	0.01 B : CHIP	0.01 B : CHIP	0.01 B : CHIP	–	0.01 B : CHIP
C517	0.1 25V F : CHIP	0.1 25V F : CHIP	0.1 25V F : CHIP	–	0.1 25V F : CHIP
C518	100 10V	100 10V	100 10V	–	100 10V
C519	15p CH : CHIP	75p CH : CHIP	15p CH : CHIP	–	15p CH : CHIP
C527	100 10V	100 10V	100 10V	–	100 10V
D501	1SS119	1SS119	1SS119	–	1SS119
D502	1SS119	1SS119	1SS119	–	1SS119
IC005	–	SDA5649X	SDA5649X	–	SDA5649X
IC501	CF72416DW	CF72416DW	CF72416DW	–	CF72416DW
IC502	CF72054NW	CF72054NW	CF72054NW	–	CF72054NW
L003	10μH : EL0405	10μH : EL0405	10μH : EL0405	–	10μH : EL0405
L501	10μH : EL0405	10μH : EL0405	10μH : EL0405	–	10μH : EL0405
L502	JW	JW	JW	–	JW
L503	10μH : EL0405	10μH : EL0405	10μH : EL0405	–	10μH : EL0405
Q501	2SC2712-YG	2SC2712-YG	2SC2712-YG	–	2SC2712-YG
R010	–	1k : CHIP	–	1k : CHIP	–
R059	–	1k : CHIP	–	1k : CHIP	–
R065	–	10k : CHIP	–	–	10k : CHIP
R066	–	10k : CHIP	–	10k : CHIP	–
R067	–	10k : CHIP	10k : CHIP	–	10k : CHIP
R068	10k : CHIP	–	10k : CHIP	10k : CHIP	–
R069	10k : CHIP	–	10k : CHIP	–	10k : CHIP
R070	10k : CHIP	–	–	10k : CHIP	–
R079	10k : CHIP	10k : CHIP	10k : CHIP	–	10k : CHIP
R081	10k : CHIP	10k : CHIP	10k : CHIP	–	10k : CHIP
R082	–	–	–	10k : CHIP	–
R084	–	6.8k : CHIP	6.8k : CHIP	–	6.8k : CHIP
R085	–	–	–	10k : CHIP	–
R087	–	100k : CHIP	100k : CHIP	–	100k : CHIP
R088	–	1.2M : CHIP	1.2M : CHIP	–	1.2M : CHIP
R089	–	100 : CHIP	100 : CHIP	–	100 : CHIP
R090	–	6.8k : CHIP	6.8k : CHIP	–	6.8k : CHIP
R091	–	1.2M : CHIP	1.2M : CHIP	–	1.2M : CHIP
R092	–	1M : CHIP	1M : CHIP	–	1M : CHIP
R093	–	2.2k : CHIP	2.2k : CHIP	–	2.2k : CHIP
R094	–	4.7k : CHIP	4.7k : CHIP	–	4.7k : CHIP
R095	–	4.7k : CHIP	4.7k : CHIP	–	4.7k : CHIP
R096	–	100 : CHIP	100 : CHIP	–	100 : CHIP
R097	–	100 : CHIP	100 : CHIP	–	100 : CHIP
R099	10k : CHIP	–	10k : CHIP	–	10k : CHIP
R501	10k : CHIP	10k : CHIP	10k : CHIP	–	10k : CHIP
R503	10k : CHIP	10k : CHIP	10k : CHIP	–	10k : CHIP
R504	1k : CHIP	1k : CHIP	1k : CHIP	–	1k : CHIP
R505	1k : CHIP	1k : CHIP	1k : CHIP	–	1k : CHIP
R507	100 : CHIP	100 : CHIP	100 : CHIP	–	100 : CHIP
R508	100 : CHIP	100 : CHIP	100 : CHIP	–	100 : CHIP
R509	15k : CHIP	15k : CHIP	15k : CHIP	–	15k : CHIP
R512	6.8k	6.8k	6.8k	–	6.8k
R514	6.8k : CHIP	6.8k : CHIP	6.8k : CHIP	–	6.8k : CHIP
R516	8.2k : CHIP	8.2k : CHIP	6.8k : CHIP	–	8.2k : CHIP
R553	1k : CHIP	1k : CHIP	1k : CHIP	–	1k : CHIP
X501	13.875MHz	13.875MHz	13.875MHz	–	13.875MHz

– : Not mounted

Schematic diagrams ← MA7(1/3) board
Schematic diagrams MA7(2/3) board →

MA7 (2/3) BOARD IC VOLTAGE LIST

IC801	1	(2.3) <4.3>		44	(2.2) <3.4>
	3	2.5		45	4.2
	4	(1.5) <0>		46	(2.3) <2.8>
	5	(2.1) <0.3>		47	3.3
	6	(2.7) <2.1>		48	(2.3) <4.3>
	7	(2.6) <3.3>	IC802	1	GND
	8	4.5		2	2.1
	9	0.6		3	4.9
	10	3.1		4	2.0
	11	2.2		6	(0) <0.3>
	12	2.7		7	1.8
	13	2.2		8	GND
	14	0.1		9	1.8
	15	1.3		10	GND
	16	2.2		11	0
	17	2.6		12	2.3
	18	0.3		13	GND
	19	2.6		14	1.7
	20	GND		15	1.7
	21	2.6		16	4.9
	22	0.1		17	GND
	23	(4.3) <1.8>		18	4.9
	24	GND		19	0.8
	25	(0) <2.4>		20	4.9
	26	0.6		21	1.0
	27	4.0		22	0.3
	28	2.6		23	2.2
	29	2.1		24	GND
	33	4.8	IC803	1	2.6
	34	0.5		2	4.9
	35	0.2		3	0.9
	36	2.6		4	GND
	37	2.6		5	0.5
	38	(2.3) <3.1>		6	3.5
	39	1.9		7	4.9
	40	(0) <0.3>		8	1.9
	41	(1.9) <1.6>		9	4.9
	42	GND		10	0.3
	43	(3.1) <3.7>			

All voltages are in V.
Pin numbers which are not described are not used.

MA7 (2/3) BOARD TRANSISTOR VOLTAGE LIST

	B	C	E
Q801	3.1	1.7	2.5
Q802	(1.7) <2.1>	4.8	(1.1) <1.5>
Q803	1.7	2.7	1.1
Q804	0.9	GND	1.6
Q805	1.6	4.8	0.8
Q806	4.8	0	GND
Q807	0	0	0
Q808	0.0	0	0
Q809	5	1.6	0.9
Q810	1.3	0	GND
Q811	0.0	0.0	GND
Q812	2.5	4.8	1.9
Q813	0.0	0	3.1
Q814	2.5	4.8	1.8
Q815	(1.7) <2.1>	4.8	(1.1) <2.1>
Q816	2.9	4.8	2.3
Q818	4.8	0	GND
Q819	0.0	0	GND
Q820	0.3	0.0	GND
Q821	1.3	4	GND
Q822	0.6	0	GND
Q824	(0.2) <2.3>	(0.6) <4.8>	(0.3) <1.7>
Q825	0	4.8	GND
Q827	0	0	GND
Q828	0.2	(1.7) <2.1>	GND
Q829	(1.7) <2.1>	GND	(1.1) <1.4>
Q830	(4.8) <0.1>	(0.6) <4.8>	4.8
Q831	(2.5) <2.8>	4.8	(1.7) <2.1>
Q832	4.8	0	0
Q833	1.9	4.8	1.3
Q834	4.8	0.3	4.8
Q835	4.8	0.3	4.8
Q836	4.8	0	0.3
Q837	2.6	4.8	1.9
Q839	4.8	GND	GND
Q840	0	0.9	GND
Q843	0	0	0
Q844	(0) <4.8>	(3.4) <0>	GND

All voltages are in V.

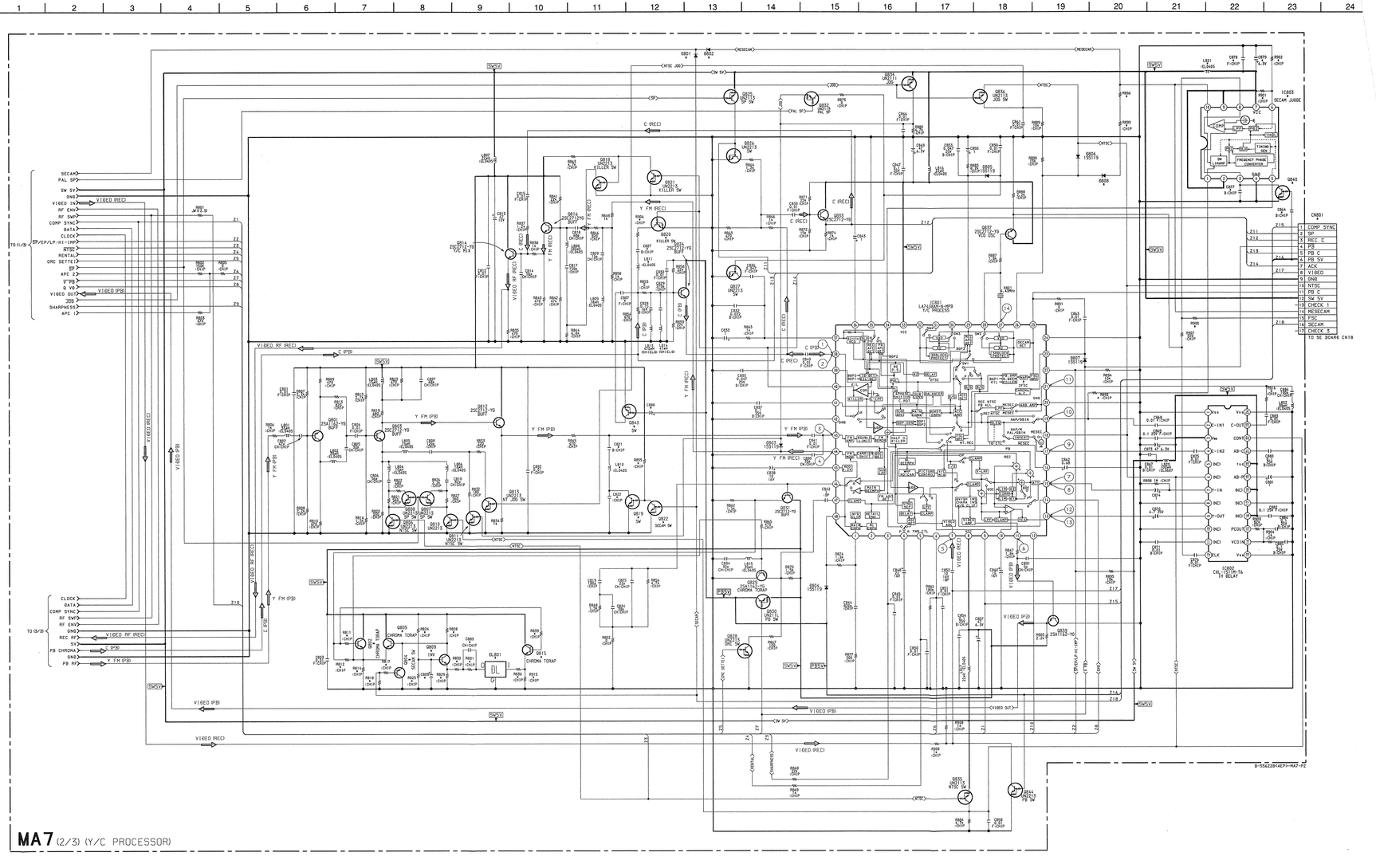
• MA7 (2/3) BOARD WAVEFORMS

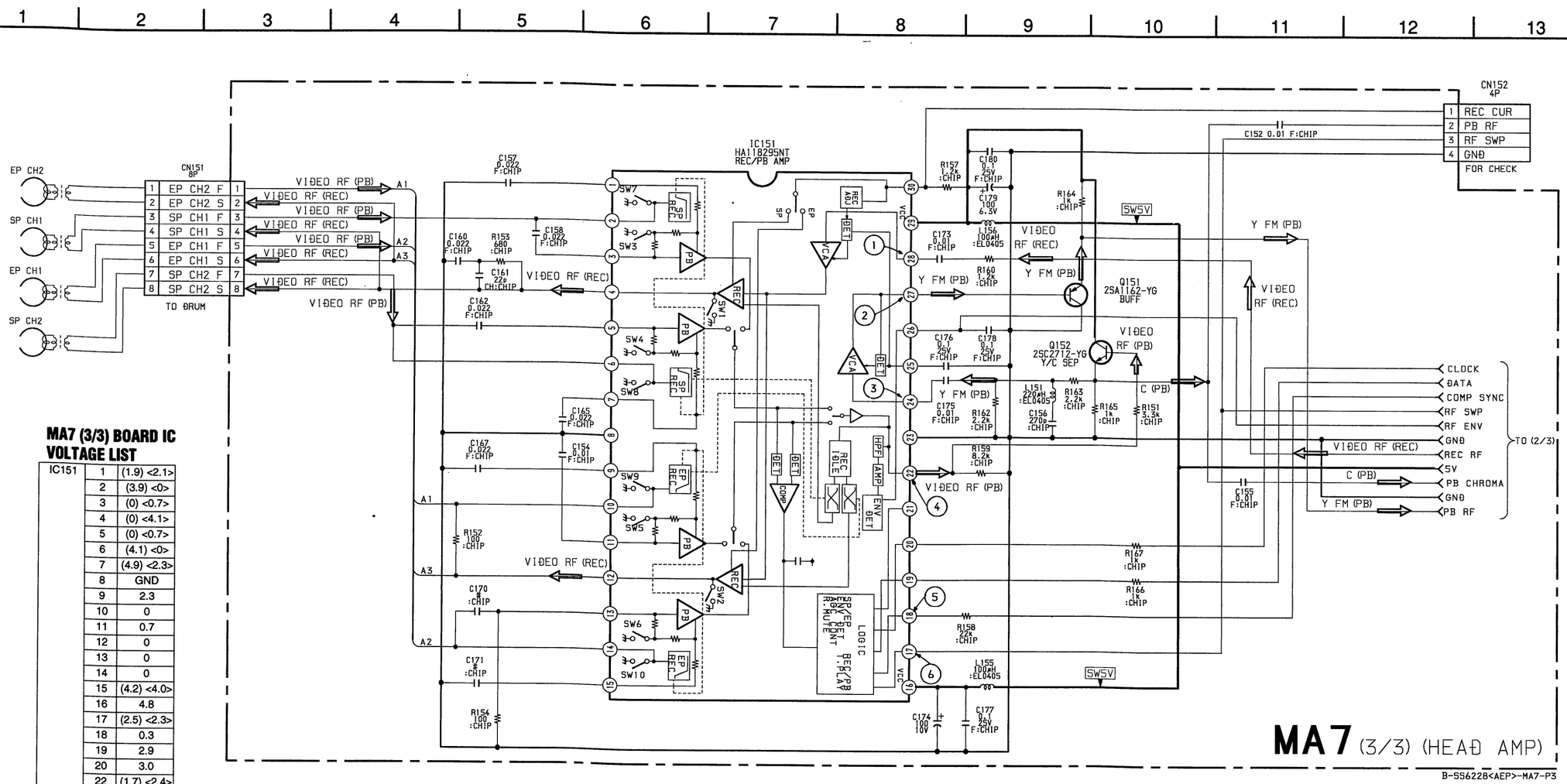
① (REC) PAL/SECAM 0.5Vp-p (H)	① (REC) NTSC 0.4Vp-p (H)	② (PB) PAL/SECAM 0.4Vp-p (H)	② (PB) NTSC 0.4Vp-p (H)	③ (PB) 0.3Vp-p
④ (REC) 0.5Vp-p	⑤ (REC) PAL/SECAM 1.0Vp-p (H)	⑤ (REC) NTSC 1.0Vp-p (H)	⑥ (PB) PAL/SECAM 2.3Vp-p (H)	⑥ (PB) NTSC 2.3Vp-p (H)
⑦ (REC) PAL/SECAM 0.4Vp-p (H)	⑦ (REC) NTSC 0.4Vp-p (H)	⑧ (PB) PAL/SECAM 0.4Vp-p (H)	⑧ (PB) NTSC 0.4Vp-p (H)	⑨ (PB) PAL/SECAM 0.3Vp-p (H)
⑨ (PB) NTSC 0.3Vp-p (H)	⑩ (PB) PAL/SECAM 0.3Vp-p (H)	⑩ (PB) NTSC 0.3Vp-p (H)	⑪ (PB) PAL/SECAM 0.3Vp-p (H)	⑪ (PB) NTSC 0.3Vp-p (H)
⑫ (REC) PAL/SECAM 0.4Vp-p (H)	⑫ (REC) NTSC 0.4Vp-p (H)	⑬ (PB) PAL/SECAM 0.4Vp-p (H)	⑬ (PB) NTSC 0.4Vp-p (H)	⑭ 0.5Vp-p (1.13MHz)

MA7 (2/3) BOARD ＊MARK LIST

	KV-21VSA21/VSE/21V6A/21V6E	KV-21V5B21V6B	KV-21V5D/21V6D	KV-21V5K	KV-21V5U/21V6U
C809	–	–	–	–	–
C821	–	0.022 B : CHIP	–	–	–
C822	–	270p : CHIP	–	–	–
C827	–	0.0033 B : CHIP	–	–	–
C864	–	0.0047 B : CHIP	–	–	–
C877	–	0.01 B : CHIP	–	0.01 B : CHIP	–
C878	–	0.01 F : CHIP	–	0.01 F : CHIP	–
C879	–	47 6.3V	–	47 6.3V	–
C887	–	0.01 F : CHIP	–	–	–
C888	–	4.7	–	–	–
C889	–	39p CH : CHIP	–	–	–
CN801	–	17p	–	–	–
D801	–	1SS119	–	–	–
D802	–	RB441Q	–	JW (5)	–
D808	–	1SS119	–	1SS119	–
DL801	–	DELAY-LINE	–	–	–
IC803	–	LA7356M	–	LA7356M	–
L810	–	68μH : ELG405	–	–	–
L811	–	39μH : ELG405	–	–	–
L821	–	100μH : ELG405	–	100μH : ELG405	–
Q802	–	2SC3712-YG	–	–	–
Q804	–	2SA1162-YG	–	–	–
Q805	–	2SC3712-YG	–	–	–
Q809	–	2SC3712-YG	–	–	–
Q815	–	2SC2712-YG	–	–	–
Q819	–	UN2213	–	–	–
Q820	–	UN2213	–	–	–
Q822	–	UN2213	–	–	–
Q840	–	UN2213	–	–	–
Q843	–	UN2213	–	–	–
R811	–	100 : CHIP	–	–	–
R812	0 : CHIP	–	0 : CHIP	0 : CHIP	0 : CHIP
R814	–	1k : CHIP	–	–	–
R817	–	10k : CHIP	–	–	–
R818	–	10k : CHIP	–	–	–
R824	–	3.3k : CHIP	–	–	–
R825	–	2.2k : CHIP	–	–	–
R828	–	2.2k : CHIP	–	–	–
R829	–	2.2k : CHIP	–	–	–
R830	–	0 : CHIP	–	–	–
R831	–	1k : CHIP	–	–	–
R836	–	1k : CHIP	–	–	–
R839	–	100 : CHIP	–	–	–
R855	–	4.7k : CHIP	–	–	–
R893	–	0 : CHIP	–	0 : CHIP	–
R896	–	1k	–	1k	–
R899	–	6.8k : CHIP	–	6.8k : CHIP	–
R900	–	JW (12.5)	–	–	–
R901	–	2.2k : CHIP	–	2.2k : CHIP	–
R902	–	6.8k : CHIP	–	6.8k : CHIP	–
R906	–	0 : CHIP	–	–	–
R915	–	1k : CHIP	–	–	–

– : Not mounted





MA7 (3/3) (HEAD AMP)

B-SS6228<AEP>-MA7-P3

MA7 (3/3) BOARD IC VOLTAGE LIST

IC151		
	1	(1.9) <2.1>
	2	(3.9) <0>
	3	(0) <0.7>
	4	(0) <4.1>
	5	(0) <0.7>
	6	(4.1) <0>
	7	(4.9) <2.3>
	8	GND
	9	2.3
	10	0
	11	0.7
	12	0
	13	0
	14	0
	15	(4.2) <4.0>
	16	4.8
	17	(2.5) <2.3>
	18	0.3
	19	2.9
	20	3.0
	22	(1.7) <2.4>
	23	GND
	24	3.5
	25	1.5
	26	(0.2) <1.2>
	27	(4.1) <1.6>
	28	(2.0) <2.2>
	29	4.8
	30	(3.9) <4.8>

All voltages are in V.

MA7 (3/3) BOARD TRANSISTOR VOLTAGE LIST

	B	C	E
Q151	(1.6) <4.1>	GND	(2.3) <4.7>
Q152	(1.2) <2.9>	4.8	(0.7) <2.2>

All voltages are in V.

• MA7 (3/3) BOARD WAVEFORMS

① (REC/PB) 0.2Vp-p

② (REC) 0.5Vp-p

③ (REC) 0.2Vp-p

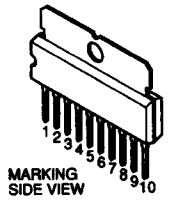
④ (REC) 0.4Vp-p

⑤ 9.8Vp-p (V)

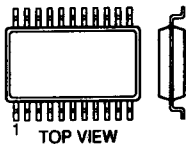
⑥ 4.7Vp-p (V)

6-6. SEMICONDUCTORS

BA6209

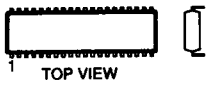


BA7796FS-E2
CXL1511M-T6



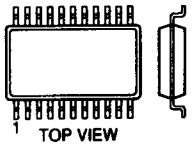
24pin SOP

CF70204NW
LA7337



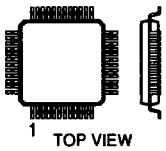
28pin

CF72416DW-R
SDA5649X-GEG



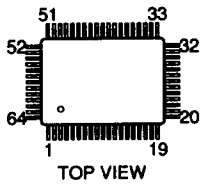
20pin

CXA1855Q
LA7438AM-N-MPB

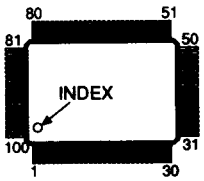


48pin QFP

CXA2076Q-TL
CXP85460-063Q-TL



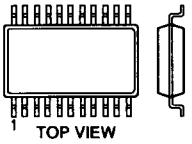
CXP87248A-038Q-TL



HA118295NT

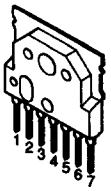
30pin DIP

LA7356M

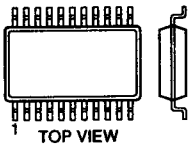


10pin

LA7840L

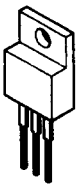


NJM062M
NJM2521M-TE1
NJM2903M
NJM2904M
S-3510ACFJ-TB
UPC393G2

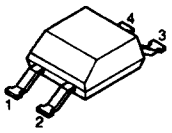


8pin SOP

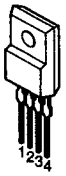
NJM78M09FA



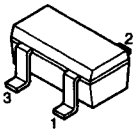
PC123F2



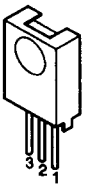
PQ05RF11
PQ09RE11
PQ12RE11



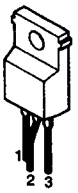
PST572C



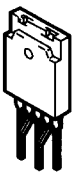
SBX1790-51
SBX1981-51



SE135N



STR-F6523



ST24C16FM6-TR

8pin DIP

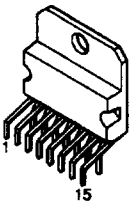
TA8823N

24pin DIP

TDA4665T-T

16pin DIP

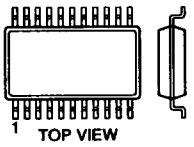
TDA7494



TDA8395T/N3

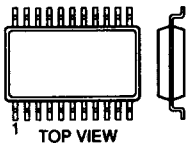
20pin

TK11819MTL



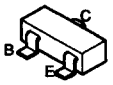
6pin SOP

U2860B-BFPG3

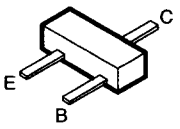


14pin

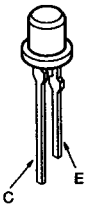
DTA114TK
DTA114TKA-T146
DTA144EKA-T146
DTA143EK
DTC143TK
DTC143TKA-T146
DTC144EKA-T146
UN211B
UN2111
UN2111L
UN2211
UN2213
UN2216
2SA1037AK-T146-R
2SA1162G
2SC1623-L5L6
2SC2712-YG
2SC3052-EF
2SD601A-Q



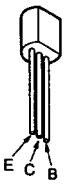
DTC123YKA-T146



PT380F



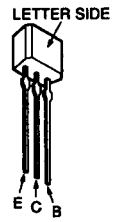
2SA1091-O
2SC1815-GR



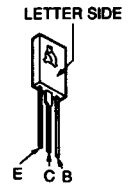
Schematic diagrams

← MA7(3/3) board

2SA1175-HFE
2SD1858-Q-TV2



2SC2611



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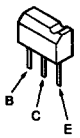
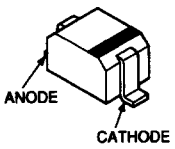
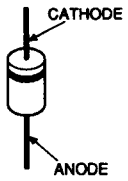


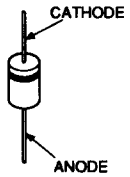
DTZ5.1B
DTZ9.1



EGP20G
EGP30D
EL1Z
ERC81-004L2Z
ERD28-08S
MTZJ-T-77-9.1A
RMG06D

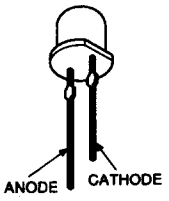


ERC06-15S

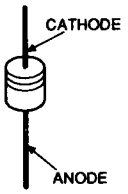


D3SB60F

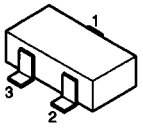
GL528V1



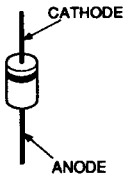
MTZJ-4.7
MTZJ-6.2B
RB441Q
RD4 .7ESB2
RD5.1ES-B1
RD5.1ES-B2
RD6.2ESB2
RD6.8ES-B2
RD9.1ES-B3
RD9.1ES-L
1SS119-25
1SS133T-77
11ES2



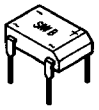
RD6.2M-B1



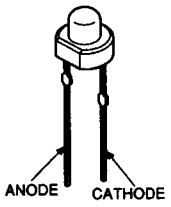
RG4C



S1WB60



SLR-325VCT31

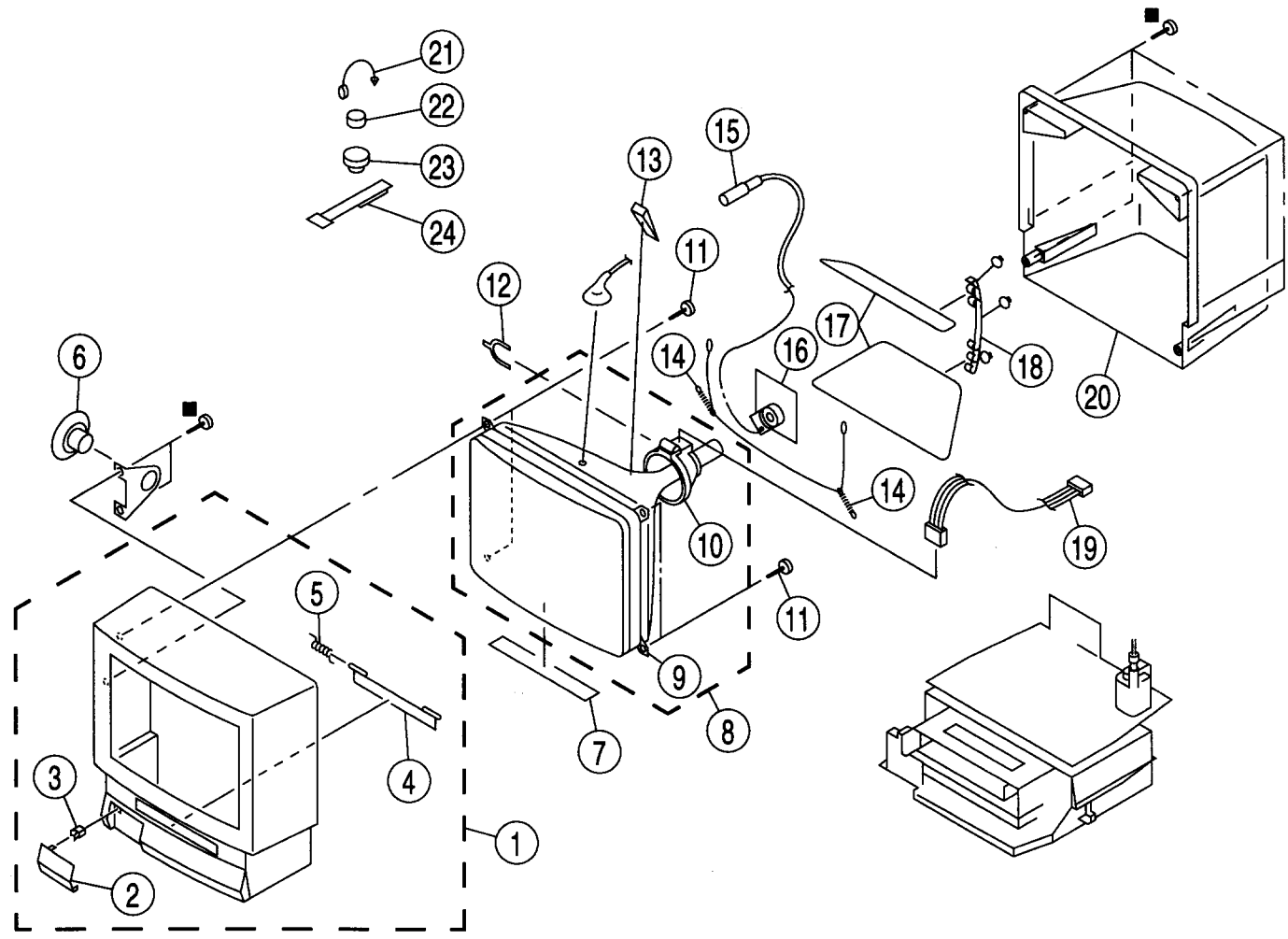


5-1. PICTURE TUBE

■ : 7-685-663-71 +BVTP 4X16

anticipated when ordering these items.

piece portant le numero specifie.

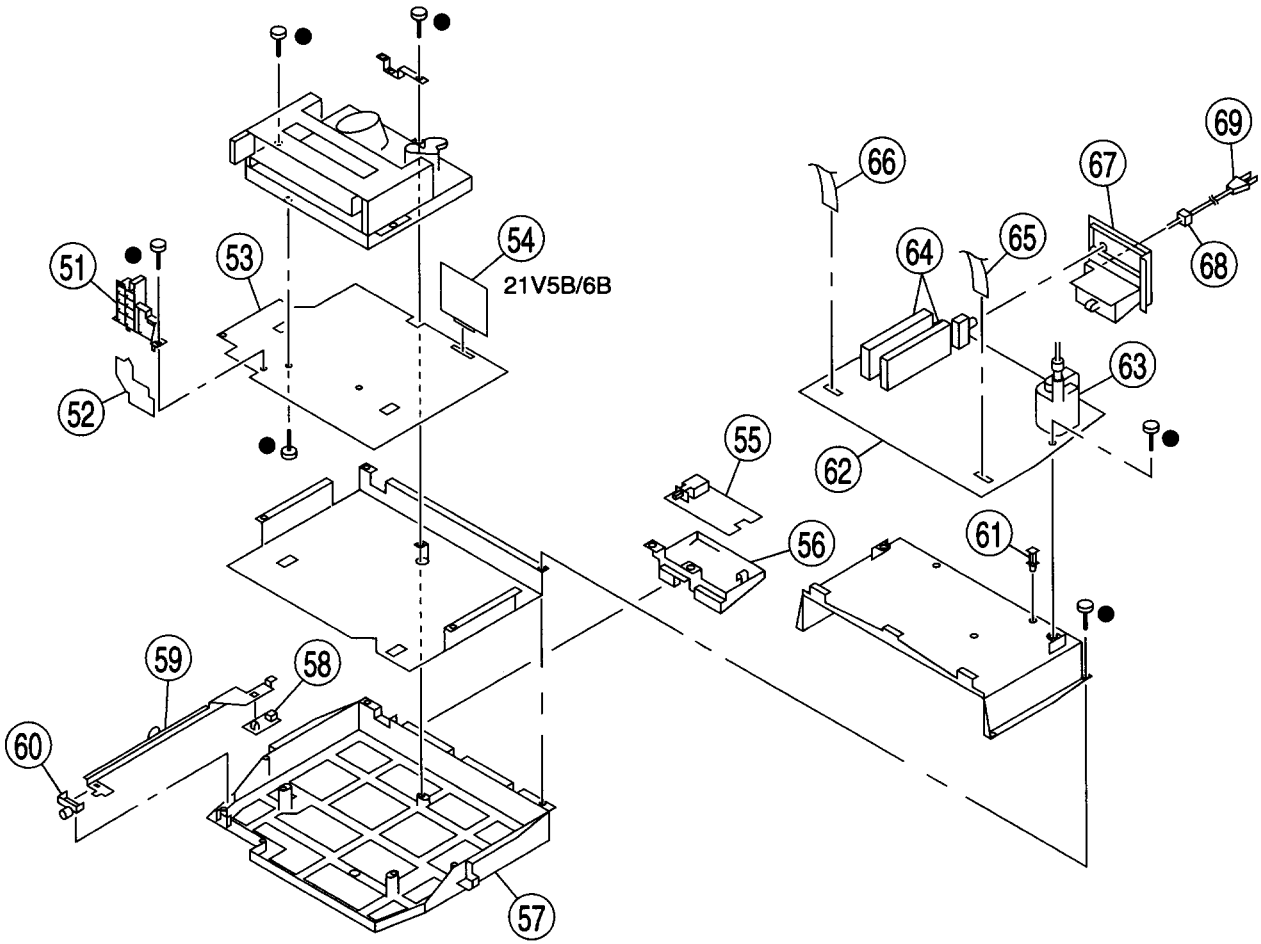


5-2. CHASSIS

Replace only with part number specified.

Ne les remplacer que par une piece portant le numero specifie.

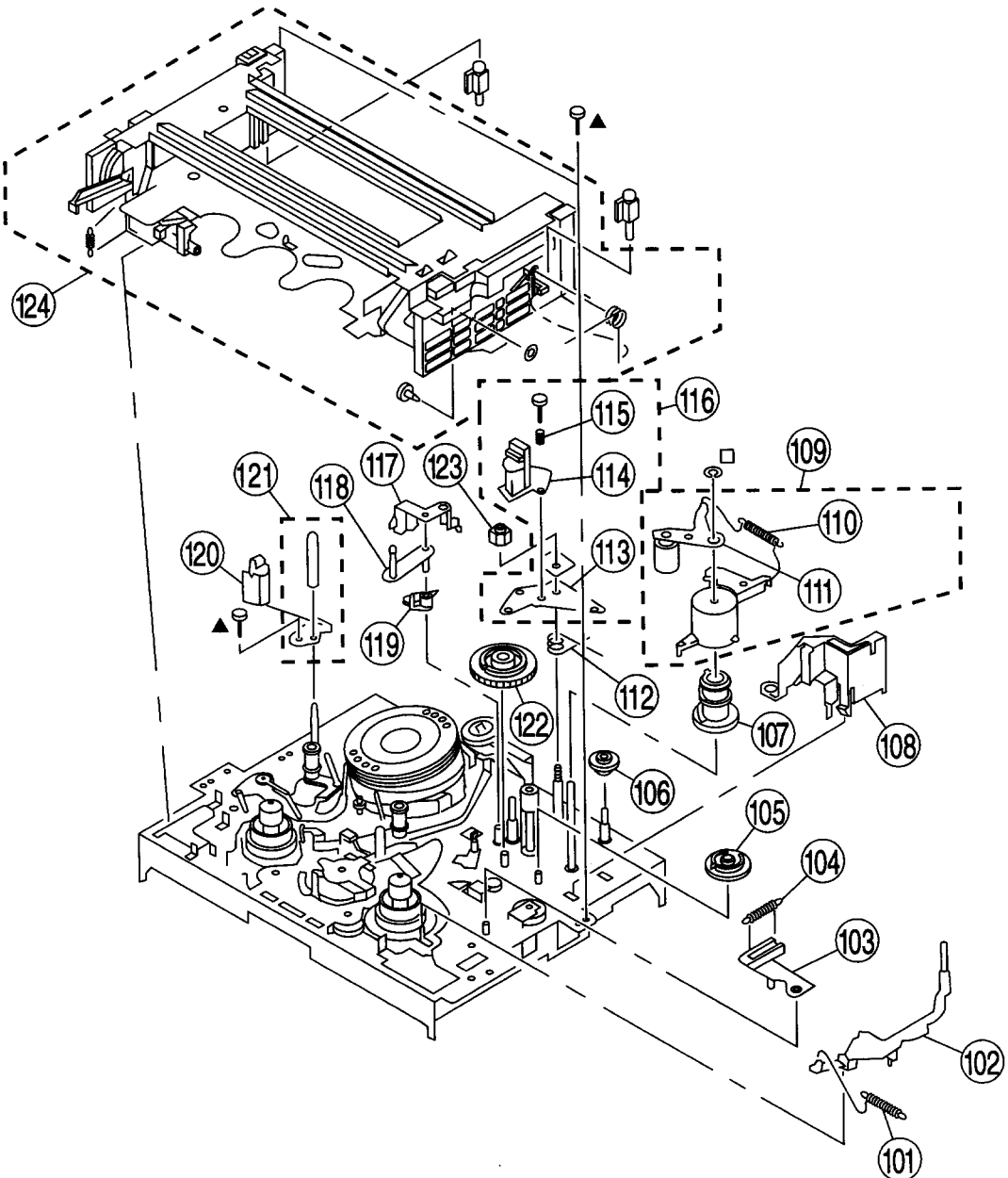
● : 7-685-648-79 +BVTP 3X12



5-3. MECHANICAL DECK ASSEMBLY 1

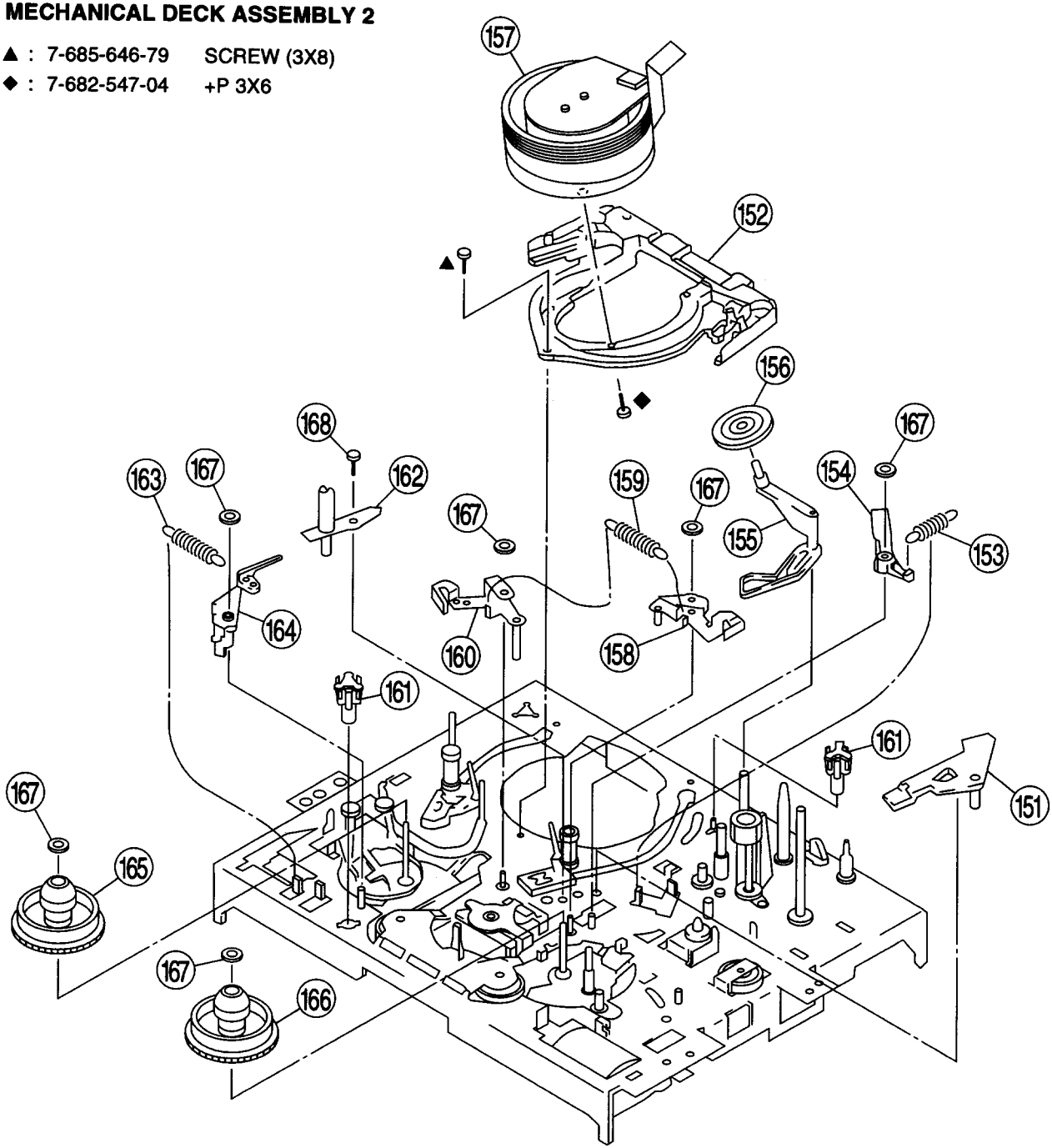
□ : 7-624-106-04 STOP RING 3.0, TYPE-E

▲ : 7-685-646-79 SCREW (3X8)



5-4. MECHANICAL DECK ASSEMBLY 2

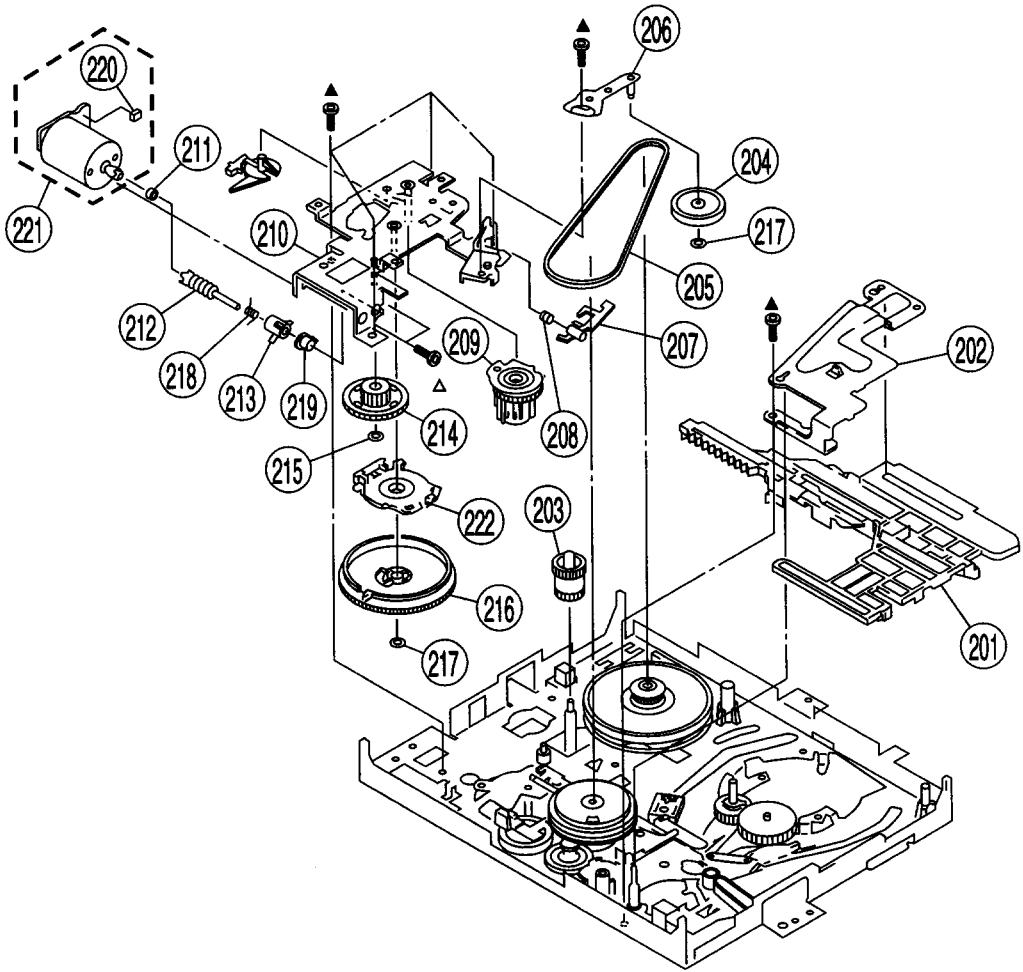
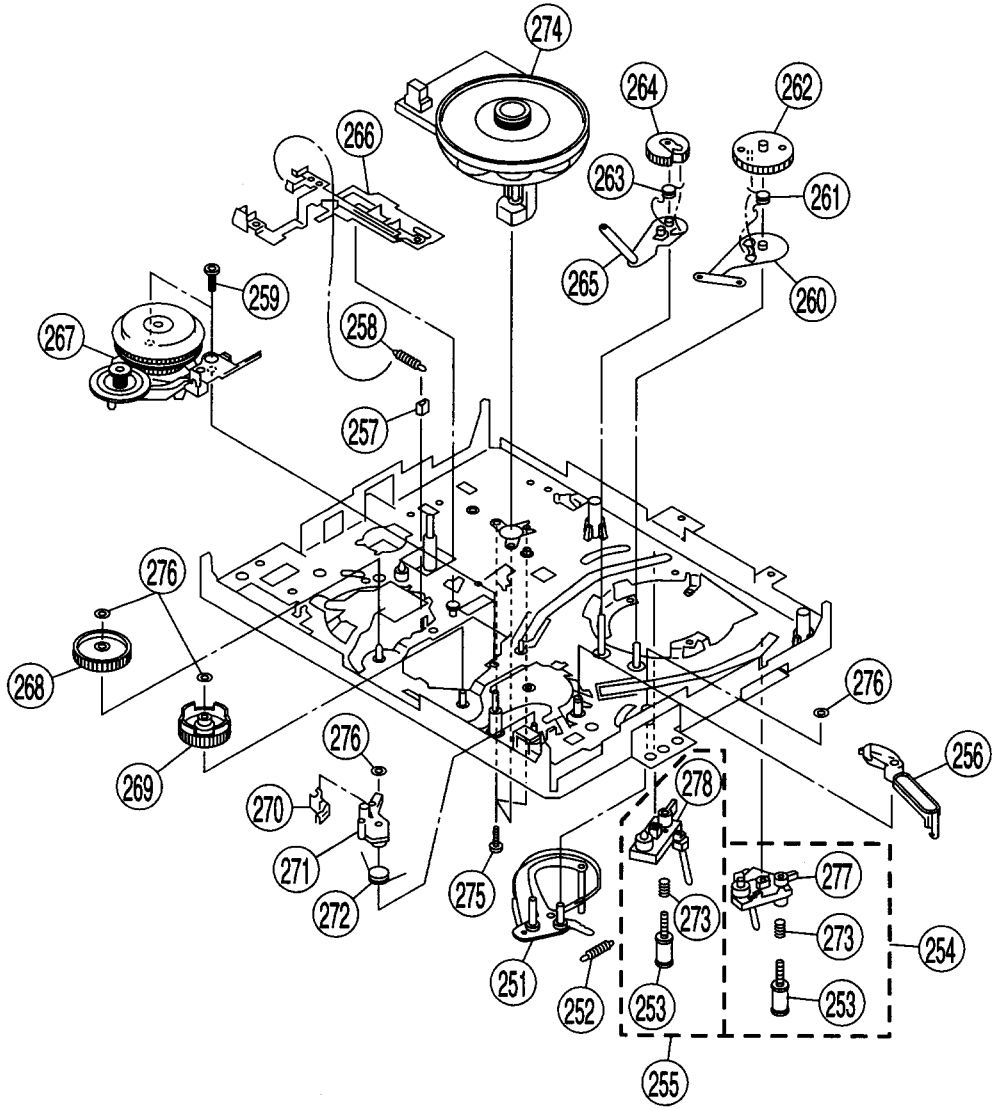
▲ : 7-685-646-79 SCREW (3X8)
◆ : 7-682-547-04 +P 3X6



5-5. MECHANICAL DECK ASSEMBLY 3

△ : 7-682-645-01 +PS 3X8

▲ : 7-685-646-79 SCREW (3X8)



5-6. MECHANICAL DECK ASSEMBLY 4